12-1982

A Study to Determine the Impact of a Colorectal Education Program on an Asymptomatic Industrial Population

Mary Christine Chizuk
The College at Brockport

A Study to Determine the Impact of a Colorectal Education Program on an Asymptomatic Industrial Population

by

Mary Christine Chizuk

A thesis submitted to the Department of Health Science in partial fulfillment of the requirements for the degree of

Master of Science in Community Health Education

State University of New York
College at Brockport

December 1982

This Thesis for the Master of Science

in Health Education

by

Mary Christine Chizuk

has been approved

Thesis Chairman

Reader

Chairperson, Department of Health Science

ACKNOWLEDGEMENTS

It is most appropriate to express my grateful thanks to specific individuals for their valuable time, effort and thoughts in this undertaking.

I would like to thank Kelli McMahon, Public Education Director at the American Cancer Society who offered me the opportunity for involvement. Her support and enthusiasm were immeasurable.

My gratitude also includes George Allen, Personnel Manager at the Rochester Telephone Company who was never too busy to answer a question or act upon a request. His commitment to Employee Health Education identifies him as a Health Educator in every parameter.

My thanks includes Ara Zulalian, Ph.D., Thesis Committee Chairperson, for his advice and directions and most of all for his belief in me. Also included are John Phillips, Ph.D. and John Sinacore, Ed.D., Thesis Committee Members.

A debt of gratitude is owed Frederick Halley, Ph.D. Professor of Sociology, for his long hours spent with me processing research data. He is truly a dedicated admirable educator.

My appreciation includes Robert Loeb, Communications Center, for his efforts in designing the advertisements for the educational program. He searched tirelessly for the most appropriate wording to communicate my message.

I would also like to express my heartfelt thanks to Jacquelin Gallagher, friend, support person, and typist. Her willingness and cheerful acceptance of this undertaking will be long remembered.

Abstract

The major purpose of this study was to evaluate the impact of a colorectal cancer education program in an asymptomatic industrial population. The variables high risk, age 40 and over, and personal perception of risk were analyzed on the basis of knowledge. A Pre and Posttest questionnaire was administered on a self-selected basis via interdepartmental mail. A thirteen item knowledge test comprised the major portion of the questionnaire consistant with the American Cancer Society's publications. A Reliability Analysis demonstrated extremely acceptable Alpha Levels on the knowledge items. The educational programs consisted of a thirty (30) minute lecture, movie and discussion on colorectal cancer and distribution of Hemoccult Test Kits. Some fifty (50) such presentations were conducted at all Company branch offices.

The major findings included the following: Knowledge increased significantly in the participants who attended the educational program, the relationship between positive or negative risk perception and mean test scores proved insignificant, the overall trend of the relationship between age and knowledge was as age increased knowledge decreased in both pretest and posttest samples, and the variable last physician visit was the only demographic variable demonstrated to be significant in relation to

risk perception.

Those who attended the educational program represented 32% (728) of the total population. Of those who attended the program 33% (237) participated in the screening. Three (3) or (1.3%) Hemoccult tests were positive. All three cases were evaluated by private physicians with Barium Enema and Sigmoidoscopy revealing normal findings.

A cost analysis was undertaken to evaluate educational and screening program expenditures. Per employee it cost $9.24 to attend the program (778) and participate in the screening (237). The total cost was $6727.25.

A cost analysis was undertaken to compare the cost of one (1) case of localized colorectal cancer for an in-hospital diagnostic evaluation and treatment. The total cost was $4,078.50.

TABLE OF CONTENTS

Pages

ACKNOWLEDGEMENTS. iii

ABSTRACT. v

LIST OF TABLES, DATA ANALYSIS xi

CHAPTER

I. INTRODUCTION 1

Introduction to the Problem 1
Statement of the Problem 6
Definition of Terminology 7
Justification 8
Delimitations 11

II. REVIEW OF THE LITERATURE 12

Introduction 12
Cost of Cancer 15
Evaluation of Screening Program Costs. . . 19
Evaluation of Screening Tests and Programs. 20
Description and Evaluation of Diagnostic Tests for Screening. 24
High Risk Factor Considerations and Selection of Target Group Populations . 29
Compliancy and Previous Screening Programs. 32
Concluding Remarks 39

III. METHODOLOGY 42

Selection of Subjects. 42
Selection of Evaluation Instruments. . . . 42
Educational Presentation 44
Methodology. 45
Comments 46

IV. DATA ANALYSIS 48

Introduction 48
Frequency Distributions for Demographic Variables 48

Pages

IV. DATA ANALYSIS (cont'd)

Reliability Analysis 53
Mean Scores of Pretest and Follow-up Samples 54
Signs and Symptoms Responses of Pretest and Follow-up Samples 59
High Risk Factor Responses of Pretest and Follow-up Samples 62
Major Health Problem and Risk Perception by Age of Pretest and Follow-up Samples 62
Risk Perception and Demographic Variables 68
Risk Perception and Mean Scores by Educational Components 68
Risk Perception and Mean Scores. 74
Age and Mean Scores. 76
Cancer Information Sources and Mean Scores 76
The Screening Program and Employee Participation 81
Program Costs. 83
Cost of One Colorectal Cancer Case . . . 85
Summary. 85

V. INTERPRETATIONS, CONCLUSIONS, AND RECOMMENDATIONS 91

Introduction 91
Sample Size. 91
Instruments. 92
Demographic Profile. 92
Past Participation Profile 92
Present Participation Profile. 95
Evaluation of Colorectal Cancer Knowledge of Respondents. 96
Evaluation of Risk Perception and Knowledge 97
Evaluation of Age and Knowledge. 99
Evaluation of Cancer Information Sources and Knowledge 100
Evaluation of Risk Perception Accuracy by Age 102
Program Costs. 103
In-Patient Diagnostic and Treatment Costs 103
Conclusions. 104

Pages

BIBLIOGRAPHY 106

APPENDICES 112

A. Cost 112

Table I Direct Cost of Cancer 1969. 113

Table II Cancer and Private Industry. 114

Table III Estimated Annual Cost to Industry of Four Major Cancers 115

Table IV Potential Impact of a Cancer Control Program. . . 116

Table V Cost of a Case of Advanced Colon Cancer . . . 117

Table VI Present Value of Lifetime Earnings 1980. . . 118

Table VII Changes in the Economic Impact on Private Industry Due to Cancer Control Using Pessimistic Assumptions 119

Table VIII Changes in the Economic Impact on Private Industry Due to Cancer Control Using Optimistic Assumptions 120

B. Risk Factors for Colorectal Cancer 121

C. Compliance 123

D. Methodology - Questionnaires 125

Pretest A 126
Posttest B 127
Follow-up C 128

Pages

E. Program Preparation 129

Corporate Schedule 130
Letter to Interdepartmental Health and Safety Committee Members . . . 132
Letter to Interdepartmental Health and Safety Committee Officers. . . 133
Public Service Request 134
Cover Letter to Employees. 135
Payroll Insert Advertisement 136
Poster Advertisement 138
Dietary Instruction Sheet. 139
Consent Form 140
Master Control Form for Laboratory Reporting. 141
Pamphlet
Two Ways to Protect Yourself
Facts on Colorectal Cancer

F. Letters of Notification 142

Negative Hemoccult Test Results to Program Participants 143
Positive Hemoccult Test Results to Program Participants 144
Positive Hemoccult Test Results to Program Participant's Physician. . 145
Positive Hemoccult Test Results Follow-up to Program Participants. 146
Positive Hemoccult Test Results Follow-up to Participant's Physician. 147

G. Post Program Publicity. 148

"Brockport Statements" 149
"Brockport Post" 151
"The Report. 152

LIST OF TABLES

DATA ANALYSIS

TABLE		Page
1	Frequency Distributions of Demographic Variables	50
2A	Reliability Analysis by Educational Categories.	55
2B	Reliability Analysis by Composite	56
3	Mean Scores of Pretest and Follow-up Samples	58
4	Cross-Tabulations for Signs and Symptoms Category.	60
5	Cross-Tabulations for High Risk Factor Category.	63
6	Cross-Tabulations for Risk Perception . . .	67
7	Risk Perception and Demographic Variables .	69
8	ANOVA, Educational Categories By Risk Perception and Mean Scores Pre and Post Programming	73
9	ANOVA, Risk Perception by Mean Scores Pre and Post Programming.	75
10	ANOVA, Age and Mean Scores.	77
11	Sources of Cancer Information and Employee Mean Scores.	80
12	Industrial Employee Participation in a Colorectal Cancer Screening Program	82
13	Colorectal Cancer Education and Screening Program Costs	84
14	Cost of an In-Hospital Diagnostic Evaluation and Surgical Treatment of One Localized Colorectal Cancer Case.	86

CHAPTER I
Introduction

One of the major health problems in today's society is Colorectal Cancer. With the exception of skin cancer it is the most frequently diagnosed malignancy. "Despite sophisticated diagnostic tools and innovative treatment methods, the Five (5) Year Survival Rate has not significantly improved over the last twenty-five (25) years.[1] To decrease the incidence of colorectal cancer and improve the survival rate, the communication of health education information and participation in early detection programs must become a significant part of the battle against cancer. "Patients with colon cancer detected while clinically asymptomatic have distant metastases less than 5% of the time and the Five (5) Year Survival Rates approach 90%."[2] The feasibility of mass screening for early detection of the disease process in asymptomatic individuals has been questioned in the past. Several different screening methods have been employed both singly and in combination. Also certain populations have been screened and in different settings. Participation rates have been both encouraging

---

[1] American Cancer Society, Cancer Facts and Figures 1981 (New York; American Cancer Society), 1980, p.11.

[2] Curtis Songster et al., "Immunochemical Detection of Fecal Occult Blood," Cancer 45 (March 1980), p. 1099.

and discouraging. This has served to cause health administrators to question the worth of budgeting health care dollars for screening, secondary prevention, in the face of rising health care costs and the medical model's traditional position of therapeutic intervention.

Several unusual problems have been encountered in the colorectal cancer screening programs unlike other secondary preventive detection programs, e.g. hypertension and glaucoma screening. (1) Colorectal cancer is the cancer no one talks about. Discussion of one's bowel habits has not been considered polite conversation. Some individuals have difficulty discussing this with their own private physician. (2) The term colorectal cancer for many is either a medical mystery or is misinterpreted. Some other individuals associate the term with the dreaded colostomy. (3) The Hemoccult Test, a do-it-yourself fecal slide test, is commonly used as a screening tool. It detects occult bleeding in the intestinal tract, an early sign of colorectal cancer. To insure accurate results the test involves dietary instructions which include abstinence from red meat and inclusion of high fiber foods beginning 24-48 hours before the collection period as well as during the three (3) day collection period. The dietary considerations and the time element of several days involved with the test requires a commitment that many perceive to be a hindrance.

Still others may consider the test itself distasteful.

The consideration that this cancer has not been talked about and has not been an acceptable conversation topic is in part responsible for its high incidence and also its low participation rates in screening programs. The American Cancer Society (ACS) has devoted a large portion of its Public Education campaign to their now well-known Seven (7) Warning Signals. Two of these Warning Signals which relate to colorectal cancer are a change in bowel habits and unusual bleeding. Yet despite active promotion of health education information many individuals are unaware of the Warning Signals or see their physician when experiencing them.

The (ACS) sponsored a nationwide survey utilizing a sample of 1553 males and females in 1978 to assess public attitudes toward cancer. "Colon and rectum cancer is mentioned by only 36% which indicated a significantly lower level of awareness than other major sites....only 10% reported they hear much about colon and rectum cancer."[3] The (ACS) study[4] indicated breast cancer is the most familiar site by 79% of the population, lung cancer follows with 64% and skin cancer with 56%. In fact, skin cancer is the most frequently diagnosed

[3]Lieberman Research Incorporated, "Public Attitudes Toward Cancer and Tests", American Cancer Society, Professional Education Publications 30 (March-April 1980), p.93.

[4]Ibid.

cancer and colorectal cancer is second. The incidence of certain cancers and the public's perception of them did not correlate closely which indicated areas of public educational needs.

The survey evidenced another finding regarding diagnostic tests. "Relatively few people (only 16%) have heard of the do-it-yourself guaiac test,"[5] This finding further indicated the need for public education regarding tests available for cancer diagnosis.

Early detection programs have utilized several testing methods for detection of colorectal cancer. The Hemoccult or guaiac slide is a simple test for blood in the stool and has been the most frequently used test. The digital examination is a manual internal palpation performed by physicians or trained medical personnel. It is often combined with the guaiac test because alone it is of limited value in examining the intestinal tract. The sigmoidoscopy or proctoscope examination is one that allows direct visualization of the lower colon or sigmoid by a lighted tube. It too must be performed by trained personnel and is of limited value allowing visualization of approximately 14% of the intestinal tract. Sigmoidoscopy involves an evacuation preparation for the patient and may be uncomfortable procedurally. It is also more costly. It too may be

[5] Ibid., p. 94.

combined with the guaiac test as a screening mechanism. Colonoscopy, a similar procedure, allows more visualization of the colon surface but is even more expensive and requires more time and medical expertise. It is also more dangerous to the patient. A Barium Enema or Lower Gastrointestinal Series is not sensitive for the detection of small lesions and is therefore not utilized as a screening test alone. A Barium Enema requires an evacuation preparation, involves exposure to radiation and is the most expensive diagnostic test.

Mass screening programs have in the past taken place in a variety of settings, employing various methods of Hemoccult distribution. Settings include clinics, hospitals and office based private practices. Methods of distribution include the mail-out method drop-in method, home visit method and small-group method."... the most effective personal distribution method is the group meeting method which achieved a return rate of 28.7%.[6] In general compliance in colorectal cancer screening programs has been poor. In certain well-motivated populations the response rate has been as high as 85%.[7] Most research in the area of colorectal cancer screening has been devoted to

---

[6] Lieberman Research Incorporated, "A Study of Alternative Means of Inducing People to do the Hemoccult Test." (New York: American Cancer Society, 1975), p.7.

[7] M. Halpen, et al., "Issues of Patient Compliance," International Symposium on Colorectal Cancer:Epidemiology and Screening. (New York:1979), p.303.

methods of distribution and diagnostic testing. The areas that must be further researched for effective screening programs relate to the issues of improved compliance, accurate risk perception and the value of public education.

Statement of the Problem

The problem was to determine the impact of a colorectal cancer education program on a asymptomatic industrial population relative to high risk, specifically age 40 and over, and risk perception.

Subproblems

(1) What was the industrial population's level of knowledge regarding colorectal cancer prior to the educational program?

(2) What was the industrial population's level of knowledge regarding colorectal cancer six weeks after the educational program?

(3) What were the demographic profiles including age, sex, education and occupation of the Pretest and Follow-up samples?

(4) Since all individuals over age 40 are standard high risk for this cancer, was age a significant variable in level of knowledge of Pretest and Follow-up respondents?

(5) What were the cancer information sources most frequently indicated by this industrial population, and how did the mean test scores correlate with the sources indicated?

(6) What was the percentage of individuals who perceived themselves to be at risk prior to the program as compared to after the program?

(7) Was the level of knowledge significantly higher in those who perceived themselves to be at risk as compared to those who did not perceive themselves to be at risk in the Pretest and Follow-up samples.

Definition of Terminology

(1) Asymptomatic refers to a disease condition existing without symptoms or indications of that disease process.

(2) Cancer refers to a disorderly and uncontrolled growth of cells in various parts of the body.

(3) Carcinoma refers to the term cancer.

(4) Colorectal refers to the colon and rectum, or large intestine or large bowel.

(5) Guaiac Test refers to a fecal test for hidden blood; it is also known as the Hemoccult Test.

(6) Hemoccult Test refers to a preliminary test for detecting hidden blood; it is also known as the Guaiac Test.

(7) High Risk refers to the presence of one or more of the following conditions which increase the possibility of developing colorectal cancer; age 40 years and over, a history of this type cancer in the family, a personal history of cancer, a history of

Definition of Terminology (cont'd)

Ulcerative Colitis and Colorectal Polyps.

(8) Mass Screening refers to a Secondary Preventive Health Care Program aimed at early disease detection involving a large number of individuals.

(9) Neoplasn refers to the term cancer or malignancy.

(10) Survival Rate or Five-(5) Year Survival Rate is a term utilized by the (ACS) to express survival after a diagnosis of cancer up to five (5) years. Individuals surviving five (5) years after diagnosis are considered cured.

Justification

Colorectal cancer is the second most common internal cancer diagnosed. Yet it is one that is much less familiar to the adult population in general. "When colorectal cancer is detected and treated in an early localized stage, the five (5) year survival rate is 71%. This compared with less than 50% when the cancer has spread to regional lymph nodes."[8] To date no prospective long term study has been conducted with published results to evaluate the impact of Health Education Programs and participation in a Hemoccult Screening Program on the incidence and survival rates of colorectal cancer. The

---

[8]American Cancer Society, Cancer Facts and Figures 1981 (New York: American Cancer Society, 1980), p.17.

(ACS) estimated that in 1981 120,000 new colorectal cancer cases will be detected and 54,900 deaths will occur. It is a major health problem today. However, the cure rate in asymptomatic individuals is estimated as high as 90%, as reported earlier.

Industry represents a large portion of the adult population and can be a valuable community health resource. Not only would the industry benefit directly by their employees being diagnosed and treated at an earlier stage but employees would also be able to either continue employment or return to employment sooner. For the employer it means less dollars spent on disability payments and also less dollars spent for temporary replacement services, an indirect savings.

A possible reward for industry might be reduced health insurance premiums for companies willing to sponsor such programs.

A company sponsoring health education programs reaps other rewards not measured in dollars and cents. No employer can place a monetary value on employee morale and loyalty. Health is highly valued by employers not only because it keeps men and women in the work-force but it also maintains higher productivity and creativity.

An industrial setting provides built-in checks for health education programs. The capabilities for

promotion of the program such as payroll inserts and poster advertising are readily available. In the past a problem with screening programs involved follow-up of participants. This problem could be minimized in industry because employees obviously return to the work place on a regular basis and could be contacted readily.

The Hemoccult Test itself is simple and inexpensive. Each slide costs $0.58. Winawer[9] indicated it is reliable with a collection of three (3) specimens. The dietary instructions are easy to follow and should cause no discomfort or additional expense. The test itself as a preliminary diagnostic test could actually reduce the cost of more expensive diagnostic studies by ruling out disease with negative findings. The false positive rate is relatively low. Positive findings indicating further diagnostic evaluations have not been so excessive in numbers that follow-up testing could not be considered feasible. The predictive value for neoplasn with positive Hemoccult Testing has been 44-50%.

The value of early detection in colorectal cancer has already been indicated. The inception of early detection involves awareness. The perception of risk factors afford the individual knowledge regarding the

---

[9]Sidney Winawer, "Screening for Colorectal Cancer: An Overview," Cancer 45 (1980), p.1075.

odds of developing this cancer. The belief that one may be at risk by age, or personal or family history may be the key to motivation for learning about this caneer and participating in screening programs.

Delimitations

(1) The sample population includes all Rochester Telephone Company employees both full and part time between the ages of 18 and 65 years.

(2) The Hemoccult Test, a product of Smith Kline Diagnostics, of Smith, Kline and French Company, is the only diagnostic test to be utilized as a screening device.

(3) The evaluation of employee colorectal cancer information is limited to a Pretest, Posttest and Follow-up questionnaire.

CHAPTER II

Review of the Literature

Introduction

Health Education and early disease detection programs have gained increasing attention over the last twenty-five (25) years. It is now known that several disease entities can be prevented or cured if detected early. The result of such programs can be lowered morbidity and mortality with subsequent savings in hospitalization costs, disability payments and personal suffering. Considering the current cost of therapeutic health care, health education and early detection programs are destined to become one of this nation's life savers and may actually save the health care system as it is known today from certain economic disaster.

Colorectal cancer has been a major health problem. "An estimated 120,000 new cases will be diagnosed with this cancer in 1981, second to lung cancer. An estimated 53,000 people will die."[1]

Colorectal cancer has been one of those diseases that is amenable to early detection. "The Five (5) Year Survival Rate is as high as 71% with early detection and is decreased to less than 50% with regional lymph node involvement."[2]

---

[1] American Cancer Society "1981 Cancer Facts and Figures" (New York:American Cancer Society Incorporated,1980),p.16.

[2] Ibid.,p.17.

Colorectal cancer has been considered treatable and curable with surgery being the most effective modality. Radiation therapy and chemotherapy have also been employed singly or in conjunction with surgery.

The American Cancer Society (ACS) has expressed cure rates as Five (5) Year Survival Rates meaning that patients who have remained free of disease for five years or longer have the same life expectancy as any individual in the general population. According to the (ACS) there are three (3) million Americans alive today with a history of cancer; two (2) million of them with a diagnosis of five (5) or more years. Survival rates could no doubt be higher in the future with health education programs, increased health awareness and participation in early detection screening programs.

Fortunately, the public has become more interested in their own health. They are also interested in how their health care dollar is spent. Therapeutic health care, however, has always been the budgetary priority.

Unfortunately, "Advances in screening and early treatment are coming at a time when there is serious nationwide concern over the total amount now spent for health care in the nation and the rate of inflation that has occurred almost every year."[3]

For health education and early detection programs to

---

[3]Jerry Cromwell and Paula Gertman, "The Cost of Cancer," Laryngoscope 89 (1979), p.393.

become a higher budgetary priority several issues must be addressed. Methods of increasing public and professional awareness as well as methods of increasing participation rates are two such issues. Other considerations comprise cost-effective determinations, including the diagnostic tool(s) employed and the educational component evaluation.

The root of the participation problem has been evidenced in part by the lack of public education regarding colorectal cancer. The Lieberman Research Incorporated[4] conducted a national study in 1978 for the (ACS) regarding public attitudes toward cancer and cancer tests. The findings included: (1) the public perceived the incidence of cancer as 1:7 while the actual medical statistics reveal 1:4, (2) the public perceived survival as 1:5 while the actual medical statistics reveal 1:3 survive.

Of the Seven (7) Warning Signals so highly publicized by the (ACS), there was less awareness of the signal "Unusual Bleeding," one indicating a possible colorectal cancer. Only 36% of those surveyed indicated colorectal cancer as a major cancer site. Only 10% reported having heard the term colorectal cancer. Some 41% mentioned lung and 53% mentioned breast as a cancer site. Regarding

---

[4] Lieberman Research Incorporated, "Public Attitudes Toward Cancer and Tests" American Cancer Society Professional Education Publications 30(March-April 1980), pp. 92-94.

colorectal cancer testing the following findings were reported: 47% were aware of the Digital Examination as a colorectal cancer test, 25% did not know the reason for a Digital Examination, 16% heard of the Guaiac test, 36% expressed an interest in performing the Guaiac test and 72% indicated if their Guaiac test results were positive they would undergo a proctosigmoid examination. The study concluded that the public underestimates cancer incidence and overestimates mortality, and there is a low level of awareness of colorectal cancer.

Cost of Cancer

Before looking ahead to the future for methods of improving screening programs and evaluating costs involved in programming, the cost of illness today should be considered.

Cromwell[5] classified the cost of illness into three (3) categories: direct, indirect and psychosocial.

Direct cost, encompassed hospitalization as an in-patient including laboratory, diagnostic radiology, surgery, radiotherapy, chemotherapy, drugs, blood products, miscellaneous supplies and nursing care. Direct cost also encompassed hospitalization as an out-patient including nursing home care, physicians (Primary Surgeon, Anesthesiologist, Radiologist, Pathologist and Consultant),

---

[5]Cromwell, pp.396-397.

home care, nursing care, rehabilitation, drugs, equipment, diet, counseling, and travel and communication expenses e.g. ambulance, out-of-area residence and telephone calls.

Indirect costs included financial burdens due to premature death to family and employer.

Psychosocial costs included emotional and behavioral effects on the patient's family and friends, instability in individual and social relations, suicide, loss of life savings, being indigent, disfigurement, loss of function (motor and sexual), divorce, family break-up, relocation, sale of home, loss of self-esteem, and child neglect. The cost of pain and suffering were not even considered in relation to cost of illness by Cromwell.

Direct costs can also be defined as billed services, reimbursed expenses, incurred expenses and out-of-pocket expenditures. Refer to Appendix Cost Table I for Cromwell's data on Direct Cost for 1969-1971. "In 1978 a Consumer Report's study said the average hospital visit for a cancer patient is 15 days. At $200 per day the hospital bill (excluding surgery and other treatments) would be $3,000!....the average cost for individual direct medical services for cancer was to be $20,000. The figure has undoubtedly increased since than."[6]

---

[6]American Cancer Society, "Facts and Figures,",p.28.

Cost of illness for colorectal cancer has been directly related to the stage of diagnosis e.g. localized, regional and distant. A method of defining tumor involvement has been known as the Dukes Staging System.[7] The system has indicated the following:

Stage A tumor located in bowel wall

Stage B tumor extending through bowel wall only

Stage C tumor involving lymph nodes

Stage C_1 tumor with central nodes free

Stage C_2 tumor with central nodes involved

Refer to Appendix Cost Table I for cost breakdown by stage of treatment.

Eddy[8] further defined the cost of cancer and the impact on the employer. The variables measured included number of new cases of cancer, number of deaths from cancer, financial cost of initial therapy, financial cost of terminal therapy, financial cost of absenteeism and sick leave, and financial cost of industry-funded life

---

[7]Murray Copeland, "New Approaches & Objectives in Controlling Cancer of the Colon & Rectum." Presentation:Prevention and Detection of Cancer Part II Detection Volume I High Risk Markers Detection Methods and Management, Proceedings of the Third International Symposium on Detection and Prevention of Cancer. (New York April 26-May 7, 1976),p.2098.

[8]David Eddy, "The Economic Impact of Cancer and Cancer Control on Private Industry," Presentation: American Cancer Society Public Education Committee (Seattle June 17, 1981),p.3.

insurance and earnings lost due to premature death. Refer to Appendix Cost Tables II and III. Eddy also estimated the potential impact of cancer control programs on these variables. Refer to Appendix Cost Table IV. In reviewing Table IV a total of $104.8 million could be saved through colorectal cancer control programs. Eddy further defined the cost of a single case of advanced colon cancer. Refer to Appendix Cost Table V. The total cost to the company was totalled as $54,100 plus lost earnings as $150,000. Utilizing Eddy's source Hodgson and Rice's "Costs of Cancer in the United States, 1977" it was determined the Advanced Cancer Case was either a 56 year old male or a 55 year old female. Appendix Cost Table VI is the Hodgson and Rice source.

Eddy's presentation represented a current thorough investigation of cancer costs beyond the more obvious hospitalization and initial and terminal therapy costs and included the financial impact on the employer. He related his dollar figures to savings after a cancer control program with both an optimistic and a pessimistic approach. Refer to Appendix Cost Table VII and VIII. Even with a pessimistic approach $63.4 million could be saved in colorectal cancer costs while an optimistic approach yielded $157.4 million (company total costs). Eddy did not indicate the cancer control methods employed in such programs nor did he indicate that an educational component was incorporated or valuable.

Evaluation of Screening Program Costs

The cost of screening, according to Cromwell[9], depends on the initial cost of the screen itself, sensitivity and specificity of the screen, relative cost of the treatment and rehabilatation at various disease stages and the prior probability of the cancer. Other cost considerations include physicians' services, labor costs, recruiting patients, the test itself, test evaluation results and follow-up. He also considered that travel discourages the poor from easy preventive medicine and testing time discourages the "better-off" who must leave work or give up leisure time.

Schweitzer[10] presented a methdological framework for a cost-effective evaluation of diagnostic tests for mass screening. The decision was based on disease incidence, probabilities of test error, cost of test, cost of treatment for found cases and the economic value (expected lifetime earnings or equivalent) of additional length or quality of life for those cured of the disease. Other cost considerations include complications of the test and cost of treating these complications as well as testing frequency, age of screenee, target group selection and payment policy. Schweitzer also pointed out society has no monetary value for pain and suffering and actually places a conservative value on lives. He concluded that screening programs

[9]Jerry Cromwell, p. 403.

[10]Stuart Schweitzer, "Cost Effectiveness of Early Detection of Diseases," Health Services Research (Spring 1974), p. 24.

are more cost-effective when the cost per test is low, the disease prevalance is high, and the cost for treatment is low.

Evaluation of Screening Tests and Programs - Criteria

The Commission on Chronic Illness was cited by Breslow[11] for identifying six (6) criteria for evaluation of screening test and programs. The criteria included reliability, validity, yield, costs, acceptance and follow-up. Reliability refers to reproducibility of results in repeated applications of the test to the same invididual at any one time and minimal range of variation in a given individual over a short period of time. Validity is measured by the frequency with which the result corresponds to the findings of an acceptable diagnostic procedure. The ideal validity in a screening test is to find all true positives and all true negatives, and to avoid false positives and false negatives. Yield may be measured by the number of previously unknown and subsequently verified cases of diseases discovered among the population tested and also by the number of persons who obtain appropriate medical supervision as a result of the screening test. Cost may be calculated on the basis of per test given, per person screened or per case found. Acceptance of screening programs

[11] Lester Brewlow, "Review and Future Perspectives of Cancer Screening Programs," Presentation: Prevention and Detection of Cancer Part II Detection Volume I High Risk Marker Detection Methods and Management, Proceedings of the Third International Symposium on Detection and Prevention of Cancer. (New York April 26-May 7, 1976), p. 1181.

may be measured by the per cent of the population participating, willingness of physicians and professional groups to collaborate in the programs and the extent to which positive test results lead to recommended action by diagnostic therapy. Adequacy of follow-up should include diagnosis and any necessary therapy for all persons in whom disease is presumptively detected through testing.

By the late 1960's criteria for evaluation of screening procedures and programs was published. The following principles of early desease detection were developed by Wilson and Junger[12].

1) The condition being sought should be an important health problem, for the individual and the community.

2) There should be an acceptable form of treatment for patients with recognizable disease.

3) The natural history of the condition including the development from latent to declared disease, should be adequately understood.

4) There should be a recognizable latent or early symptomatic stage.

5) There should be a suitable screening test or exmination for detecting the disease at the latent or early symptomatic stage, and this test should be acceptable to the population.

---

[12] Ibid., p.1182.

6) The facilities required for diagnosis and treatment of patients revealed by the screening program should be available.

7) There should be an agreed policy on when to treat patients.

8) Treatment at the pre-symptomatic, borderline stage of a disease should favorably influence its course and prognosis.

9) The cost of case-finding (which would include the cost of diagnosis and treatment) needs to be economically balanced in relation to possible expenditures on medical care as a whole.

10) Case-finding should be a continuing process, not a "once and for all" project.

Breslow[13] also cited criteria for Evaluation of Screening Programs developed by the World Health Organization (W.H.O.). These include:

1) Screening must lead to an improvement in end-results (defined in terms of mortality; physical, social and emotional function; pain; and satisfaction) among those in who early diagnosis is achieved or in the other members of the community.

2) The effectiveness of potential components of multiphasic screening should be demonstrated individually prior to their combination.

---

[13] Ibid., p.1184.

3) The cost-benefit and cost-effectiveness characteristics of mass screening and long term therapy must be known. This knowledge is considered essential in developing an appropriate mix of diagnostic and therapeutic services in the face of finite man power and financial resources.

4) The burden of disability for the condition in question (in terms of disease frequency, distribution, severity and alternative approaches to its detection and control) must warrent action.

5) The cost, sensitivity, specificity and acceptability of the screening test must be known and it should lend itself to the utilization patterns of the target population.

6) Ideally, an estimate of the social benefit of preventing, arresting and curing the condition should be known.

Cochrane and Holland[14] defined sensitivity as the ability of the test to give a positive finding when the individual has the disease or abnormality under investigation while specificity was defined as the ability of the test to give a negative finding when the individual does not have the disease. Their definition most closely align the Commission on Chronic Illness's ideal validity criteria. They believed the cost aspect should be addressed in relation to the benefits resulting from the early detection i.e. the severity of the disease, advantage of treatment at an early stage and probability of cure.

---

[14] Ibid., p. 1185.

Larry Green stated."....cost-benefit estimates could be made on the trade-off between investments in health education related to specific diseases and projected savings in primary health care, bed-days, medical care, work-days lost, long term home or institutional care and rehabilitation.[15] Green cited the Cost Benefit Index as a standardized measure for comparison between programs, places and times, and the Hovland Effectiveness Index as a measure of changes controlling for ceiling effect.

Description and Evaluation of Diagnostic Tests for Colorectal Cancer Screening

The Hemoccult Test[16] is an impregnated guaiac slide for testing occult or hidden blood in a fecal speciman. The test detects peroxidase activity of hemoglobin which is critical for the transfer of oxygen resulting in oxidation of phenolic guaiac compounds. The colorless compounds become blue with the presence of peroxidase activity. Certain vegetables such as horseradish contain peroxidase and could result in false positive test results if ingested during the testing period. The Hemoccult has been more reliable than other occult blood tests with a positive rate of 0.5-3.5% and a high predictive value for neoplasm at 44-50%. The test detects blood in the gastrointestinal tract which often is of a non-cancerous etiology. Bleeding from a Gastric Ulcer, Ulcerative Colitis or Hemorrhoids will all yield

---

[15] Lawrence Green, "Education Costs and Medical or Administration Benefits. "Health Education Monographs (1974), p.47.

[16] Sidney Winewer. "Screening for Colorectal Cancer: An Overview Cancer 45 (1980), p.1095.

positive results. The test is based on the premise that tumors even in early stages of development bleed intermittantly. Asymptomatic individuals with such tumors will have positive Hemoccult tests especially with adherance to dietary instructions. Beginning 24-48 hours prior to fecal speciman sampling and continuing through the collection period the diet should include: fresh vegetables especially lettuce, spinach, and corn; fresh fruit especially apples, prunes and plums; moderate amounts of peanuts, popcorn and bran; no red meat, horseradish or turnips; no iron preparations, ascorbic acid, or aspirin containing medicines. The high roughage diet has been advocated to effect scratching or scraping the surface of the tumor to induce bleeding.

Morris[17] reported as little as ten (10) cc's of blood would produce a positive test result. Hemoccult tests are reported as positive, trace, or negative. Both Glober[18] and Winawer[19] agreed that trace results were potentially significant and could not be disregarded. Morris[20] further

---

[17] David Morris, John Hansell, David Ostro and Chaun-Shue Lee, "Reliability of Chemical Tests for Fecal Occult Blood in Hospitalized Patients", Digestive Diseases 21 (October 1976), p. 844.

[18] Gary Glober and Stephen Peskoe, "Outpatient Screening for Gastrointestinal Lesions Using Guaiac-Impregnated Slides," Digestive Diseases 19 (May 1974), p. 402.

[19] Sidney Winawer, "Detection of Early Colon Cancer and Colonic Polyps, "Presentation: Prevention & Detection of Cancer Part II Detection Volume II Cancer Detection and Specific Sites Proceedings of the Third International Symposium on Detection and Prevention of Cancer (New York April 26 - May 7, 1976), p. 2106.

[20] Morris, p. 845.

indicated that positive Hemoccult test results usually involved significant bleeding and appeared to be the test of choice provided at least three (3) fecal specimens were tested to minimize false negative results.

Greegor[21] was one of the first to note that early colorectal tumors tend to bleed intermittantly. Greegor's[22] experience over a ten (10) year period with the Hemoccult test yielded 142 cancer cases and one (1) false negative case. Winawer[23] reported a 1% rate of false negatives. "There are many reasons for false negativity including: the patient did not adhere to instructions regarding diet and slide preparation; substances interfered with the guaiac reaction such as ascorbic acid; a leison did not bleed at time of sampling; sampling error occurred in preparing the slides; and initially positive slides converted to negative after standing for several days".[24]

The cost of screening with fecal occult testing appears to be feasible but the cost-effective cost benefit issues

---

[21]David Greegor, "Occult Blood Testing for Detection of Asymptomatic Colon Cancer," Cancer 28 (July 1971),p.131.

[22]Greegor, "Detection of Colon Cancer in the Asymptomatic Patient," Presentation: Prevention and Detection of Cancer Part II Detection Volume II Cancer Detection in Specific Sites. Proceedings of the Third International Symposium on Detection and Prevention of Cancer. (New York April 26-May 7, 1976),p.2111.

[23]Winawer, "Feasibility of Fecal Occult Blood Testing for Detection of Colorectal Neoplasm:Debits & Credits," Cancer 40 (1977),p.2618.

[24]Ibid.

remain to be better determined according to Winawer[25]. In 1975 Newhauser[26] used $4.00 as the cost of one (1) Guaiac test with an additional $1.00 for each subsequent test. The expense for follow-up of positive results represents the higher cost of screening: $100 per Barium Enema and $15.00 per Sigmoidoscopy. Miller[27] utilized a 1977 figure of $1-2 per patient screened with an average of $50 for Barium Enema and $35 for Sigmoidoscopy. His United States population consisted of 2,332 patients. The estimated cost of the total program was $4500. Sigmoidoscopy would have cost $82,000. The Frome Experiment conducted in England by Farrands[28] was not considered to be cost-effective. Each test cost $1.75. Some 9000 tests were mailed out by a group of private physicians with only a 25% response rate from their patients. Other screening costs including postage, salaries, etc. totalled $25,000.

Sigmoidoscopy has been utilized in the past alone and in conjunction with other diagnostic tests in screening programs. Flexible sigmoidoscopy, an improved method of

---

[25] Ibid., p.2169

[26] S. Fletcher, Canadian Task Force on the Periodic Health Examination Condition: Carcinoma of the Colon & Rectum (March 1978), p.8.

[27] Sidney Miller and Ruth Knight, "The Early Detection of Colorectal Cancer," Cancer 40, (1977), p.948.

[28] P.A. Farrands, R.L. Griffiths and D.C. Britton, "The Fromee Experiment: Value of Screening for Colorectal Cancer," Lancet (June 6, 1981), p.1232.

sigmoidoscopy has proven to be the better examination in that it is better tolerated by the patient and allows more visualization (30cm or more) of the colon. Winawer[29] concluded it required experienced practitioners, more time and more costly equipment. Winawer[30] reported 50% of the cancerous leisions occur in the distal 25cm of the bowel; routine sigmoidoscopy reaches only the distal 16 cm. The cancer detection rate for the over 40 population with routine sigmoidoscopy was determined as one (1) for every 667 examinations or 1.5/1000. The diagnosis of polyps was reported at a rate of 3.7-9.7%. The cost of the sigmoid test, expertise required and only partial visualization of the colon precluded this examination as an effective screening tool.

The Barium Enema (B.E.)(more often was utilized as an adjunct to a diagnostic evaluation than as a screening tool alone. Winawer et.al[31] advocated that the (B.E.) be performed after a positive Hemoccult Test, a negative proctoscope or to confirm a positive proctoscope.

---

[29] Winawer et al., "Comparison of Flexible Sigmoioscopy With Other Diagnostic Techniques in the Diagnosis of Rectocolon Neoplasia." Digestive Diseases and Sciences 24 (April 1979),p.280.

[30] Winawer, "Screening for Colorectal Cancer: An Overview," Cancer 45 (1980),p. 1093.

[31] Winawer et al., "Screening for Colon Cancer," Gastroenterology 76 (1976),p.787.

High Risk Factor Considerations and Selection of Target Group Populations

Reaching a select population or target group may be a program objective to yield a large number of cases per program. Risk factors for colorectal cancer may be categorized as standard or general, or as specific. Age is known to be a standard risk factor. All individuals over age 40 are at risk according to the (ACS). Certain disease entities such as Ulcerative Colitis and Familial Polyps Syndrome are specific risk factors. In addition a personal cancer history and a family with a colorectal cancer history are both high risk factors. Refer to Appendix Risk Factors in Colorectal Cancer Table I.

Winawer[32] and Sherlock[33] reported that the incidence of colorectal cancer increased significantly in 40-50 year old persons and increased approximately two-fold in each succeeding decade peaking at age 75. Sherlock further reported that, "When cancer is superimposed on Ulcerative Colitis is occurs at least one or more decades earlier; it (colorectal cancer) is more evenly distributed throughout the colon and usually has a higher grade of malignancy.[34]

---

[32] Ibid., p. 783.

[33] Paul Sherlock & Sidney Winawer, "Role of Early Diagnosis in Controlling Large Bowel Cancer; An Overview," Cancer 40 (1977), p. 2610.

[34] Ibid.

Both reported that the risk was five (5) to ten (10) times greater for the development of this cancer in patients diagnosed with Ulcerative Colitis. Winawer[35] further indicated that if the onset was before age 25 the risk doubles for these individuals.

The risk for colorectal cancer, Winawer[36] reported, is increased by past personal history of adenoma of the colon, or female genital cancer. Detection and removal of adenomas and polyps has created controversy over the feasibility of removing all such detected polyps and the potential malignancy of these leisions. Sherlock stated ".....the detection and removal of polyps through the colonoscope will prevent the development of future cancer of the colon as it apparently has in the rectosigmoid."[37] Winawer et. al.[38] also indicated detection of adenomas was an important goal in screening for colorectal cancer since excision of these leisions would result in a lowered incidence of this cancer in the screened group over a period of years. Winawer further suggested that selective

---

[35]Winawer, "Screening for Colon Cancer," Gastroenterology 70 (1976) p. 784.

[36]Winawer, "Screening for Colorectal Cancer: An Overview," Cancer 45 (1980), p. 1094.

[37]Sherlock, "Role of Early Diagnosis in Controlling Large Bowel Cancer: An Overview," Cancer 40 (1977), p. 2610.

[38]Winawer et.al., "Feasibility of Fecal Occult-Blood Testing: Debits and Credits," Cancer 70 (1977), p. 2618.

screening of high risk groups would be more productive than mass screening of standard risk patients. The Canadian Task Force Report[39] concluded 95% of the cases of colorectal cancer were age 45 and older, and also advocated selective screening.

"The critical issue in screening asymptomatic patients for colorectal cancer is related to expected benefits, population at risk, sensitivity and specificity, available screening and diagnostic testing, cost-effectiveness and patient compliance."[40]

The potential benefit to the entire screened population utilizing the Hemoccult test is a decrease in mortality.

The potential risk to the patient utilizing the Hemoccult Test as a screening device was non-existant.

"Screening with fecal occult blood testing has been shown to be feasible and productive but cost-effectiveness must be demonstrated."[41]

---

[39] S. Fletcher, Canadian Task Force (March 1978), p. 5.

[40] Winawer, "Screening for Colon Cancer: An Overview, Cancer 45 (1980), p.1093.

[41] Ibid.

Compliancy and Previous Screening Programs

The criteria for evaluation of screening programs as cited by the Commission on Chronic Illness included acceptance and follow-up. These criteria relate to compliance. Halper et.al [42] utilized several broad indices associated with Rosenstock's Health Belief Model which affected compliance. These include: general health motivation, perceived susceptibility to the disease, perceived severity of the disease, perceived benefit from receiving health action, confidence in the physician and medical care, and perceived barriers to compliance. Refer to Appendix Compliance Table I Health Belief Model.

A screening program for colorectal cancer sponsored by the Memorial Sloan-Kettering Cancer Center and Preventive Medical Institute Strang Clinic [43] was evaluated on the basis of patient compliance. The sample population of 22,000 consisted of well-educated middle class individuals. A sub-sample of 1088 were age 40 and over. 86% of the sub-sample completed the Hemoccult Test which included dietary restrictions. The demographic data including age, sex, religion, ethnicity, marital status and income were analyzed on the single variable of compliance. No

---

[42] M. Snyder Halper, S. Winawer, R.S. Brody, M. Andrews, D. Roth and G.Burton, "Issues of Patient Compliance" International Symposium on Colorectal Cancer:Epidemiology and Screening (New York:1979), p.303.

[43] Ibid.

significant statistical data was evident except 41% of the non-compliant were under age 50. Regarding concern for one's health, the non-compliant were more concerned, not less concerned, at 44% as compared to the compliant group at 37%. Regarding physician office visits if well, the non-compliant by 50% did not see their doctor at all as compared to the complaint group at 33%. The non-compliant at 60% felt cancer was very disruptive as compared with 41% of the compliant group. The compliant tended to have more illness experience and felt the diet instructions involved with the Hemoccult Test were less intrusive than the non-compliant group. It was concluded that no patterns of health beliefs were linked to compliance. An area of possible research involved past health care practices and physician visits as well as beliefs regarding cancer and attitudes toward the test. It was speculated that a more sophisticated presentation of the impact of cancer and the importance of screening may increase compliance.

Winawer[44] indicated in a national public awareness survey that people visit their physicians for the following reasons: experiencing symptoms 39%, requiring an examination 32%, and self-motivation 29%. Also he reported 52-54% had a health check-up within one (1) year, 30% had a check-up within one to five years, 7-8% had not had a check-up for more than five years and 10% never had a health check-up. Of the physicians surveyed

[44] Winawer and Sherlock, "Screening for Colorectal Cancer," Gastroenterology 70 (1976), p. 788.

less than 50% performed sigmoidoscopy examinations and only 50-60% performed digital examinations on a routine basis without the presence of symptoms.

The ACS's Lieberman study[45] in 1975 evaluated the willingness of retired teachers to participate in a Hemoccult Screening Program utilizing five (5) distribution methods differing in personal contact. The sample consisted of 11,115 individuals in four (4) different sections of the United States. The type distribution method and response rates reported were as follows: mail-out 15.4%, select mail-out 13.1%, come-in 8.6%, group meeting 28.7%, and at home 20.4%. The overall return rate was 15.2% or 1,690 responses. The positive test results rate was 3.2% or 58 tests. The number of cancer cases detected was two (2).

Elwood et. al.[46] reported on the Lieberman study and concluded (1) participation rates were higher in the better educated, (2) non-participants either considered the test to be part of their annual physical examination or were not interested in the program (3) resistance to participation could be minimized by promotion of the pro-

---

[45]Lieberman Research Incorporated, "A Study of Alternative Means of Inducing People to do the Hemoccult Test," (New York: American Cancer Society, 1975), pp. 7, 8, and 11.

[46]Thomas Elwood, Allan Erickson and Seymour Lieberman, "Comparative Educational Approaches to Screening for Colorectal Cancer," American Journal of Public Health 68 (1978), p.137.

gram and emphasis on the value of the test as an important adjunct to the health examination.

Antonovsky[47] recommended that participation rates could be improved in early detection programs by fostering a socio-cultural climate which approved of regular preventive check-ups and by organizing programs on a group, institutionalized basis, so motivation is a response to a group norm, not an individual one. He also stated, "The person who delays in turning to a physician when a symptom is perceived may not be the same kind of person who rejects participation in screening programs."[48]

In relation to the ACS Lieberman study on attitudes a study of a community cancer screening clinic was conducted by Roswell Park Memorial Institute[49] in Erie County, New York, in 1978. The characteristics of the 517 screened were as follows: 75% age 40 or over, 68% were married, 64% achieved a high school education, and 72% had an income of $15,000 or more. Also 91% of the males considered themselves to be in good health while only

---

[47]Aaron Antonovsky and Harriet Hartman, "Delays in Detection of Cancer: A Review of the Literature" Health Education Monographs (Summer 1974), p.112.

[48]Ibid.

[49]Mehdi Kizilgash, et. al., "Community Cancer Screening Clinic: Evaluation of Experience," New York State Journal of Medicine (October 1979), p.1704.

87% of females considered themselves to be in good health; 66% of the males had an annual physical examination as compared to 71% of the females.

Winchester[50] reported the results of a screening program sponsored by Northwestern University and a Chicago television station. It was concluded: (1) the public considered the occult blood test to be a method of avoiding sigmoidoscopy and the barium enema and (2) the physicians lacked understanding of the significance for positive occult blood testing. In the study 54,101 test kits were requested after an active promotional and educational program. Dietary instructions including abstinance from meat and inclusion of high fiber were incorporated. The number of compliant was 14,074 (26%) with 617 (4.38%) having positive test results. Of those with positive tests 215 were unable to be followed, 123 had incomplete diagnostic evaluations, and 33 had no evaluation. Of those who were evaluated 27 were asymptomatic and 2 were symptomatic and were subsequently diagnosed with colorectal cancer. In addition 40 cases of colorectal polyps were diagnosed.

In Hastings'[51] study of the Mercer County New Jersey Medical Society Screening Program 3,450 individuals

---

[50] David Winchester et.al., "A Mass Screening Program for Colorectal Cancer Using Chemical Testing for Occult Blood in the Stool." Cancer 45 (1980), p.229.

[51] Janis Hastings, "Mass Screening for Colorectal Cancer," The American Journal of Surgery 127 (1974), p.229.

registered for the Hemoccult Test after a public education campaign. Dietary instructions were included with test kits. The number compliant was 2,625 (76%) with 159 (6%) having positive test results. Of those with positive test results, 121 (76%) were followed up: 51 received a Sigmoidoscope Examination and Barium Enema. Cancer cases diagnosed and treated numbered five (5); three (3) were considered surgically cured. The data was also analyzed on the basis of age 40 and over. These results included: 2,272 individuals registered for the test, 1,835 (80.8%) were compliant, 114 (6.2%) had positive test results, 89 (78%) were followed, 41 had complete diagnostic evaluations and 2 cancer cases were diagnosed or 1 per 450.

In Miller's[52] study of a colorectal cancer screening program at Mathers Air Force Base in California the target population was a group of retirees. The program was set up on a drop-in basis. The registrants numbered 2,332; 77% were age 40 or over. A 97.7% compliancy rate was achieved after a publicity campaign. Diet instructions were given to registrants who had initial positive test results. After the initial testing 53 (2.3%) had positive test results. After the second testing 11 (0.5%) had positive test results. Cancer cases number three (3).

---

[52]Sidney Miller, "Early Detection of Colorectal Cancer," Cancer 40 (1977), p. 946.

Miller[53] summarized the findings of other researchers utilizing the occult blood test in detection of colorectal cancer. This summary did not include compliancy rates, however. The following includes his summary:

Researcher	Participants	Cancer Cases	Detection Rate	Stage of Diagnosis
Glober	1689	3	.18	A-C-C
Hastings	2625	5	.19	A-B-B-C-D
Gregor	2000	7	.35	--
Ross	1103	4	.36	--
Miller	2322	3	.13	A-B-B
Total	9747	22	.23	

The Frome Experiment[54] in England and Wales involved a group of general practioners utilizing the Hemoccult mail-out invitational method sent to private patients. The program was well publicized. Some 8925 inviations were sent and 2439 patients accepted the test; the compliancy rate was reported at 27%. Positive test results numbered 24 (5%). False positive test results numbered 39. One (1) false negative test result was reported. Cancer cases detected were 12. It was reported that the highest response at 36% was by women 50-60 years of age.

Another study performed in England and Wales by Hartcastle[55] involved mail-out invitations by general

---

[53] Ibid., p., 948.

[54] P. A. Farrands et.al., "The Frome Experiment" Lancet (June 6, 1981), p. 1232.

[55] J. D. Hartcastle et.al., "Screening for Symptomless Colorectal Cancer by Testing for Occult Blood in General Practice," Lancet (April 12, 1980), p. 792.

practioners to their patients over age 45. Of the 1,638 invitations mailed with a letter of explanation, 742 (45%) were compliant and 29 (3.8%) had positive test results. After dietary limitations were included, repeat tests showed five (5) positive test cases. Two (2) cancer cases were diagnosed. Hardcastle considered compliance to be contingent upon factors such as test acceptibility, public awareness and education about colorectal cancer, methods of test distribution and financial consequences of the test.

Glober's[56] study of asymptomatic Japanese-Americans for this cancer involved 1682 males age 57-72 utilizing the clinic method of distribution. The compliancy rates were reported at 91.5%. Subjects were volunteers and told they were assisting in a research project, not in a screening program. Positive test results without dietary instructions were 400. Repeat tests of 344 resulted in 53 positive results after dietary limitations were incorporated. Of these, 32 (60.4%) were evaluated with four (4) cancer cases diagnosed.

Concluding Remarks Regarding Screening Programs

Screening is more than a one time only session. Miller[57] considered screening to be a part of an educational process to improve health care. It is an opportunity

---

[56]Glober, "Outpatient Screening Using Guaiac Slides," Digestive Diseases 19 (May 1974), p.400.

[57]Miller p.1219.

for an examination, for health education, and for counseling.

Breslow[58] concluded that early detection offers the only substantial hope for decreasing the mortality rate with no immediate prospects of primary prevention available. For the future he speculated that screening will be an important element in cancer control and become more important as more effective therapy is found for early stages of the disease.

Halper[59] concluded that patient perception is the crucial variable in explaining compliance. The aspects of perception included: symptoms of the disease itself, body sites and the treatment regimen.

Winawer stated, "It is clear that a significant reduction in colorectal cancer mortality rates will not result until there is increased public awareness and a reorientation of the approach to asymptomatic patients in individual practices and clinics, and in the community at large within the framework of cost-effectiveness and efficiency. It may be necessary to link cancer detection with prepaid benefits of employment contracts and with preventive programs supported by public funds so it becomes widespread and penetrates all levels of society.[60]

---

[58] Breslow, p. 1202.

[59] Halper, et.al., p. 300.

[60] Winawer, "Screening for Colorectal Cancer," Gastroenterology 70 (1976), p. 788.

"The challenge is to save from advancing fatal disease those millions of people whose lives are now destined to be forfeited to cancer. Tens of thousands who develop cancer each year in the United States are now being spared death from this disease because of deliberate screening efforts; probably another one hundred thousand could be so benefited each year through intensive development and application of screening techniques."[61]

[61] Breslow, p. 1204.

CHAPTER III

Methodology

The study was designed to determine the impact of a Colorectal Cancer Education Program on an asymptomatic industrial employee population. The research design methodology selected consisted of a pretest, posttest and follow-up questionnaire. The instruments included three (3) questionnaires to evaluate knowledge regarding colorectal cancer. Knowledge assessment was based on two (2) components: Signs and Symptoms, and High Risk Factors.

Selection of Subjects

Subjects included all full and part time Rochester Telephone Company (RTC) employees between the ages of 18 and 65. All employment levels were included e.g. management, clerical, and installation repairmen or craft personnel. The total employee population numbered 2306.

Selection of Evaluation Instruments

The pretest, posttest, follow-up questionnaires were designed utilizing information provided by the American Cancer Society publication "Facts on Colorectal Cancer" and their film presentation "The Cancer No One Talks About."

The three questionnaires included demographic data: Sex, Age, Ethnic Origin, Highest Educational Level Attained and Occupation. Other pertinent question items

included were Last Physician Visit, Previous Participation in a Colorectal Screening Program, Previous Participation in the RTC Program and Previous Use of the Screening Device, the Hemoccult. The subjects were also requested to indicate their perceptions regarding Colorectal Cancer as a Major Health Problem and Personal Risk for this cancer. The pretest questionnaire requested the employee to supply his or her source of information for colorectal cancer. The follow-up survey requested information regarding the employees' reason for participation or non-participation in the program. Refer to Appendix Methodology for the Questionnaires utilized in the study.

The promotion of the educational program and screening was designed to effect employee awareness of the forthcoming program in a timely organized manner. Every effort was made to allow time for employees to attend a presentation. A corporate schedule was developed to reach employees in all branch offices. Refer to Appendix Program Preparation, Corporate Schedule. As part of the program promotion the three (3) individuals involved in presenting the programs attended the RTC Health and Safety Committee Meeting. Their goal was to communicate the significance of the educational program and participation in the screening. Committee members were urged to encourage their co-workers to attend the presentation, participate in the screening and return completed questionnaires.

One week later all RTC employees were sent an interdepartmental letter explaining the Colorectal Cancer Educational Program. Refer to Appendix Program Preparation for Cover Letter. Attached to the letter was the pretest, Survey A. Surveys were to be completed and returned to the RTC Benefit Office via interdepartmental mail within ten (10) days. A payroll insert was designed by the Communications Center at the State University College at Brockport to promote the program capitalizing on the theme "More Talk." from the American Cancer Society's film "The Cancer No One Talks About." The payroll inserts were distributed one (1) week before the presentations began. A poster was also designed to further advertise the date, time and place of the presentation. The poster capitalized on the ACS theme once again with "Let's Talk." Posters were distributed one day after the payroll insert distribution. Refer to Appendix Program Preparation for Payroll Insert and Poster.

Educational Presentation

Each of the 58 presentations were planned for 30 minutes in a gathering place proximal to the work site of the employees at that particular facility. After a brief introduction by a Health and Safety Committee Member the presentor discussed the purpose of the program. The ACS film "The Cancer No One Talks About" was shown. The film

was approximately 12 minutes in length. A take-home dietary instruction sheet was distributed to each employee. The instruction sheet also included specific information regarding labeling of test kits necessary for proper laboratory identification. A consent form was also distributed with each Hemoccult Test Kit. The Posttest was then distributed, completed and reviewed as time permitted. Refer to Appendix Program Preparation for Dietary Instruction Sheet and Consent form.

Methodology

All employees had the opportunity to attend the educational presentation and participate in the screening program at the worksite on company time.

No employee was given special attention to encourage attendance.

The presence or absence of high risk factors such as age was not considered as part of the criteria for either attendance or participation in the program.

All employees were assured of confidentiality. No attendance records were maintained and no names were requested on the questionnaires.

All employees who wished to be screened were required to complete a consent form and indicate a physician to be notified in the event the Hemoccult Test result was positive.

The Hemoccult Test Kits, a product of Smith, Kline,

French Diagnostics, was the exclusive screening tool utilized. The one (1) unit slide kit consisted of six (6) slides for three (3) specimans.

All employees who participated in the screening program were notified of test results both negative and positive as soon as possible with no more than a two week delay. Employees with negative test results were notified by an interdepartmental letter. Employees with positive results were notified by United States mail. In addition, employees with positive test results had the physician notified as indicated on the consent form by United States mail. Refer to Appendix Letters of Notification.

All test results were reported as negative or positive. Trace results were considered positive.

All tests were read and reported by the Highland Hospital Clinical Laboratory Staff. Also included in the Appendix Program Preparation is a Master Control Form for Laboratory Reporting.

The Follow-Up questionnaire was distributed six (6) weeks after the final educational presentation via the payroll insert method and were to be returned completed to the Benefit Office via interdepartmental mail.

Comments

In attempting to compare knowledge levels on the pretest, posttest and follow-up questionnaires, the posttest, Survey B, lacked symmetry for a reliable evaluation when

compared with the pretest and follow-up questionnaires. Although question items were related on the posttest and consisted of comparable test item information, the post-test was not identical in format. At the time of posttest design, the purpose was simply to assess the participants knowledge after the educational presentation. The elimination of redundancy for the employees was the consideration. It was perceived that repeating the same questionnaire in a short period of time would result in a lowered respone rate. Unfortunately as a result of the asymmetrical questionnaires the only data considered valuable on the posttest were the demographic variables.

The advertisement of the program was believed to be valuable. Despite efforts to distribute information via payroll inserts, some employees did not receive information on the program. Written comments on the follow-up questionnaire indicated certain employees had no awareness of the program. Exactly how many others were also unaware of the educational presentation and screening program was not investigated.

Further attempts to retrieve missing questionnaires were not undertaken. It was believed that ample time had been allowed for completion and return of the questionnaires.

CHAPTER IV

Data Analysis

Introduction

The purpose of the data analysis was to evaluate the level of knowledge of an asymptomatic industrial population regarding colorectal cancer before and after an educational program. The variables high risk, specifically age and personal perception of risk were of particular interest in evaluating their effect on knowledge. Also of interest was the respondents' source of colorectal cancer information indicated in the Pretest (Survey A) analysis.

A secondary purpose of the data analysis was to evaluate the screening portion of the program including employee participation.

The final data analysis involved costs. The program costs including the educational and screening portions have been considered as well the cost of one in-hospital colorectal cancer case for diagnosis and surgical treatment in the Rochester, New York Area.

Data Presentation

Frequency Distributions for Demographic Variables

Initial frequency distributions are presented for demographic variables for all three (3) surveys including Sex, Age, Ethnic Origin, Highest Level of Education Completed, and Occupation. Also included were Last Physician Visit, Previous Participation in a Colorectal Cancer Screening

Program, Tested for Colorectal Cancer in the Last Year, Previous Use of the Hemoccult Test, and Personal Perception of Risk.

Since the Posttest (Survey B) lacked symmetry with the Pretest (Survey A) and Follow-up (Survey C), only the above items listed have been included in the analysis. All other Posttest (B) items have been excluded; the items although similar in content, were not exactly the same as the items in the Pretest (A) and Follow-up (C) questionnaires.

It became known through respondents' comments written on the Follow-up (C) questionnaire that many did not attend the educational program or complete the Pretest (Survey A). Therefore only data from respondents who indicated Yes on Survey C that they participated in the recent screening program have been included in the analysis. The item referred to is Item 28 on the Follow-up (Survey C). This (C) subsample now designated as (Css) can be compared with the Pretest (A) sample. These two (2) samples are the only groups utilized in the major data analysis. Sample (A) represented 90.8% of the analyzed population while Sample (Css) represented 9.2% of the analyzed population. Refer to Table I for Frequency Distributions of Demographic Variables.

Sample (A) respondents numbered 533. Sample (B) respondents numbered 726. Sample (C) respondents numbered 274. Subsample (C) or (Css) numbered 54. The Relative Frequency was reported only for variables with 1% or more missing cases for Samples (A)and (B) and 1.9% or more

Frequency Distributions of Demographic Variables

Table I

Pretest (A) Cases: 533 Missing Cases indicated for 5 plus responses or 1%(Rel. Frequency)
Posttest (B) Cases: 726 Missing Cases indicated for 7 plus responses or 1%(Rel.Frequency)
Follow-up (Css) Cases: 54 Missing Cases indicated for 0 plus responses or 1.9%(Rel.Fre.)

	A			B			Css		
Frequency	Absolute	Adjusted(%)	Relative(%)	Absolute	Adjusted(%)	Relative(%)	Absolute	Adjusted(%)	Relative (%)
Sex									
Male	349	65.6		445	61.5		28	51.9	
Female	183	38.4		279	38.5		26	48.1	
Age									
Under 20	3	0.6		5	0.7		0	0	
20-29	79	14.8		107	14.8		14	25.9	
30-39	194	36.4		233	32.1		14	25.9	
40-49	151	28.3		225	31.0		11	20.4	
50-59	93	17.4		143	19.7		15	27.8	
Over 60	13	2.4		12	1.7		0	0	
Ethnic Origin						2.1			3.7
White	502	94.9		650	91.4		47	90.4	
Black	24	45		52	7.3		4	7.7	
Other	3	0.6		0	1.3		1	1.9	
Educational Level									1.9
Grade School	10	1.9		14	1.9		1	1.9	
High School	358	67.4		543	75.1		37	69.8	
College-2yr.	92	17.3		117	16.2		11	20.8	
College-4yr.	48	9.0		34	4.7		2	3.8	
Post.Grad.	23	4.3		15	2.1		2	3.8	
Occupation						1.2			1.9
Supervisory	149	28.4		127	17.7		17	32.1	
Clerical	114	21.7		188	26.2		18	34.0	
Craft	262	39.9		402	56.1		18	34.0	

Table I (Continued)

Frequency	A Absolute	A Adjusted(%)	A Relative(%)	B Absolute	B Adjusted(%)	B Relative(%)	Css Absolute	Css Adjusted(%)	Css Relative (%)
Last Dr. visit						1.1			1.9
Within 1 yr.	330	61.9		419	58.4		36	67.9	
Within 1-2yrs.	97	18.2		157	21.9		14	26.4	
Within 2-3yrs.	49	9.2		60	8.4		0	0	
Over 3 yrs.	57	10.7		82	11.4		3	5.7	
Participated in any C/R Screening Program			1.3						3.7
Yes	161	30.6		196	27.2		38	73.1	
No	343	65.2		521	72.3		14	26.9	
Don't Know	22	4.2		4	0.6		0	0	
Tested C.R Ca. in Last Year						1.1			0
Yes	91	17.2		123	17.1		34	630	
No	410	77.3		579	80.6		18	33.3	
Don't Know	29	5.5		16	2.2		2	3.7	
Tested With Hemmocult									
Yes	100	18.9		178	24.6		27	50.9	
No	306	58.0		513	71.0		21	39.6	
Don't Know	122	23.1		32	4.4		5	9.4	
Perceive Self at Risk			4.5			5.6			1.9
Yes	76	14.9		142	20.7		15	28.3	
No	204	40.1		366	53.4		26	49.1	
Don't Know	229	45.0		177	25.8		12	22.6	

missing cases for Sample (Css).

Respondents for all three (3) samples were more frequently male, aged 20-39, white with a high school education and craftsmen by occupation. Sample (Css) differed in that all three (3) occupational categories were closely represented. The mean age of the samples were as follows: (A) 35.5 years, (B) 35.9 years, and (Css) 35.0 years.

Frequency Distributions for other variables were also considered. The variable Last Physician Visit had four (4) time element categories. (Css) respondents represented 67.0%, the highest frequency response, for the Within One (1) Year category. Sample (A) and (B) respondents represented 61.9% and 58.4% respectively in the same category. Sample (Css) respondents represented 5.7% for the two (2) categories 2-3 years and over 3 years. Sample (A) respondents represented a combined total 19.9% while Sample (B) represented a combined total of 18.8% for the same two (2) categories.

The variable Participation in any Colorectal Cancer Screening Program had three categories: Yes, No, and Don't Know. Sample (A) responses were Yes 30.6% and No 77.3%. Sample (B) responses were Yes 27.2% and No 72.3%. Sample (Css) responses, however, were Yes 73.1% and No 26.9%.

The variable tested for Colorectal Cancer in the Last Year included three (3) categories Yes, No and Don't Know. Samples (A) and (B) responses were similar: Yes 17.1% and 17.2%, and No 77% and 80%. Sample (Css) responses were Yes

63.0% and No 33.0%.

The variable tested with the Hemoccult included the category responses Yes, No, and Don't Know. Sample (A) responses included Yes 18.9% and No 58.0%. Sample (B) responses included Yes 24.6% and No 71.0%. Sample (Css) responses included Yes 50.9% and 39.6%.

The variable Perceive Self at Risk included the same three (3) categories. Sample (A) responses were Yes 14.9% and No 40.1%. Sample (B) responses were Yes 20.7% and No 53.4%. Sample (Css) responses were Yes 28.3% and No 49.1%.

The educational component of Surveys (A) and (C) was subdivided into two (2) categories. Signs and Symptoms and High Risk Factors. The Signs and Symptoms category included items 11-17 on Survey (A) and items 9-15 on Survey (C). These items included Persistant Lower Abdominal Pain, Change in Bowel Habits, Blood in the Stool, Persistant Diarrhea, Persistant Constipation, Ribbon-Like Bowel Movements and Rectal Pain or Pressure. The High Risk Factor category included items 18-25 on Survey (A) and items 16-23 on Survey (C). These items included Age, Sex, Race, Personal History of Cancer, Family History of Cancer, Family History of Colorectal Cancer, Previous Diagnosis of Ulcerative Colitis, and Colorectal Polyps.

Reliability Analysis A Reliability Analysis was undertaken to evaluate the validity of these items.

"Reliability is defined as the variation over an indefinitely large number of independent respected trials of errors of measurement."[1]

A Reliability Coefficient of 1.000 represents no error of measurement. One item in each category proved to be less reliable. In fact the item Persistant Diarrhea in the Signs and Symptoms category had a negative correlation of -0.73082. The item Family History of Cancer in the High Risk category also had a negative correlation with a -0.21237 score. See Tables 2A and 2B for the Reliability Coefficients both before and after deletion of the above items. Table 2A indicates the item analysis by the two (2) categories Signs and Symptoms and High Risk Factors. Table 2B indicates the items as a Composite. All further data were analyzed on the basis of these two (2) items, Persistant Diarrhea and Family History of Cancer, deleted. The Alpha Levels of 0.93070 for Signs and Symptoms and 0.71950 for High Risk Factors after deletion were considered reliable. The 13 item Composite Alpha Level of 0.85178 was considered very reliable.

Mean Score of Pretest and Follow-up Respondents

The two (2) samples (A) and (Css) were scored on these 13 reliable items. The Signs and Symptoms category represented six (6) items or Base equals 6.00 while the High Risk category represented seven (7) items or Base equals 7.00. In the Signs and Symptoms category Sample (A) respondents

[1] C. Radlai Hall and Norman H. Nile SPSS Update, (New York), McGraw Hill, (1979), p.11.

Reliability Analysis of Educational Items
By Signs and Symptoms and High Risk Factors

Table 2A

Signs and Symptoms	Total Correlation for All Items	Total Correlation with Deleted Items
Abdominal Pain	0.79711	0.81085
Change in bowel habits	0.78009	0.82938
Blood in stool	0.77162	0.84243
Persistant Diarrhea	-0.73082	Deleted
Persistant Constipation	0.77361	0.79388
Ribbon-like bowel movements	0.64785	0.64708
Rectal pain/pressure	0.83002	0.85720
	Alpha = 0.74976	Alpha = 0.93070
High Risk Factors		
Age	0.20828	0.21029
Sex	0.32449	0.30460
Race	0.35324	0.32292
Personal History of Cancer	0.40320	0.46420
Family History of Cancer	-0.21237	Deleted
Family History of C/R Cancer	0.55199	0.62415
Dx Ulcerative Colitis	0.48949	0.51909
Dx C/R Polyps	0.52774	0.57283
N = 587	Alpha = 0.62953	Alpha = 0.71590

Reliability Analysis of Educational Items by Composite

Table 2B

	Total Correlation for All Items	Total Correlation with Deleted Items
Abdominal Pain	0.63442	0.67891
Change in Bowel Habits	0.63521	0.70505
Blood in Stool	0.64312	0.72661
Persistant Diarrhea	-0.58731	Deleted
Persistant Constipation	0.61289	0.66322
Ribbon-like Bowel Movements	0.54407	0.56641
Rectal Pain/Pressure	0.65962	0.71399
Age	0.18226	0.17902
Sex	0.23227	0.20220
Race	0.27047	0.23337
Personal History of Cancer	0.41146	0.43147
Family History of Cancer	-0.22619	Deleted
Family History of C/R Cancer	0.53193	0.55231
Dx Ulcerative Colitis	0.46901	0.46518
Dx C/R Polyps	0.51329	0.52070
N = 587	Alpha = 0.75116	Alpha = 0.85178

scored a mean of 2.08 while the Sample (Css) respondents scored a mean of 3.17. In the High Risk Factor category, Sample (A) respondents scored a mean of 2.18 while Sample (Css) respondents scored a mean of 4.1. In the Composite category Sample (A) respondents scored a mean of 4.25 while Sample (Css) respondents scored a mean of 7.28. The Composite Base was 13.00.

Each correct response in the 13 item analysis was valued at 7.7%. In the Composite of both categories the Pretest (A) respondents scored a mean of 4.25 or 32.7% while the Follow-up (Css) respondents scored a mean of 7.28 or 56.0%. The overall increases in knowledge after the educational program was 23.3%. Table 3 represents test scores with F Test and t Test Analysis.

For the Signs and Symptoms category F = 1.11 with 2 tailed Probability = 0.66.

For the High Risk Factor category F = 1.40 with 2 tailed Probability = 0.07.

For the Composite of the two (2) Categories F = 1.06 with a 2 tailed Probability = 0.73.

The t value for Pooled Variance Estiamte with d.f. = 585 and 2 tailed Probability of 0.002 was 3.13 for the Signs and Symptoms category.

Table 3

Mean Scores of Pretest and
Follow-up Respondents

A N = 533
Css N = 54

Signs and Symptoms (Base = 6.00)

	Mean
A	2.08
Css	3.17

F Value = 1.11 2 Tailed Probability = 0.664
t Value Pooled Variance Estimate = 3.13
Degrees of Freedom 585 2 Tailed Probability = 0.002

t Value Separate Variance Estimate = 3.26
Degrees of Freedom 65.47 2 Tailed Probability = 0.002

High Risk Factors (Base = 7.00)

	Mean
A	2.18
Css	4.11

F Value = 140 2 Tailed Probability = 0.07
t Value Pooled Variance Estimate = 7.10
Degrees of Freedom 585 2 Tailed Probability = 0.000

t Value Separate Variance Estimate = 6.18
Degrees of Freedom 60.89 2 Tailed Probability = 0.000

Composite (Base = 13.00)

	Mean
A	4.25 (32.7%)
Css	7.38 (56.0%)

F Value = 1.06 2 Tailed Probability = 0.73
t Value Pooled Variance Estimate = 5.94
Degrees of Freedom 585 2 Tailed Probability = 0.00

t Value Separate Variance Estimate = 5.80
Degrees of Freedom 63.57 2 Tailed Probability = 0.000

The t Value for Pooled Variance Estimate with d.f. = 585 and 2 tailed Probability of 0.000 was 7.10 for the High Risk Factor category.

The t Value for Pooled Variance Estimate with d.f. = 585 and 2 tailed Probability of 0.000 was 5.94 for the Composite categories.

The Separate Variance Estimate was considered more significant statistically.

The t Value for Separate Variance Estimate with d.f. = 65.47 and a 2 tailed Probability of 0.002 was 3.26 for the Signs and Symptoms category.

The t Value for Separate Variance Estimate with d.f. = 60.89 and a 2 tailed Probability of 0.000 was 6.18 for the High Risk category.

The t Value for Separate Variance Estimate with d.f. = 63.57 and a 2 tailed Probability of 0.000 was 5.80 for the Composite categories.

Correlations were sought to identify relationships between the Pretest, Sample (A), and the Follow-Up, Sample (Css), on the Signs and Symptoms and High Risk Factor items.

Signs and Symptoms Responses of Pretest and Follow-up Samples

Table 4 depicts that data on an item by item basis including the Pearson r and per cent change in correct responses from the Pretest sample to the Follow-Up sample. The Signs and Symptoms items including Abdominal Pain, Change in Bowel Habits, Blood in Stool and Ribbon-like Bowel Movements all had significance levels less than 0.05

Table 4

Cross Tabulations for the
Signs and Symptoms Category

Signs and Symptoms

1) Persistant Abdominal Pain

	A	Css	Knowledge Change (%)
*Yes	173 (33.2%)	27 (51.9%)	18.7
No	247 (47.4%)	18 (34.6%)	12.8
Don't Know	101 (19.4%)	7 (13.5%)	5.9
Missing Cases	12 (2.3%)	2 (3.7%)	

r = 0.09 P = 0.009

2) Change in Bowel Habits

*Yes	219 (41.4%)	36 (67.9%)	26.5
No	242 (45.7%)	15 (28.3%)	17.4
Don't Know	68 (12.9%)	2 (3.8%)	9.1
Missing Cases	4 (0.81%)	1 (1.9%)	

r = 0.15 P = 0.0001

3) Blood in Stool

*Yes	230 (43.5%)	38 (70.4%)	26.9
No	245 (46.3%)	14 (25.9%)	20.4
Don't Know	54 (10.2%)	2 (3.7%)	6.5
Missing Cases	4 (0.81%)	0	

r = 0.15 P = 0.0002

4) Persistant Constipation

*Yes	171 (32.6%)	24 (45.3%)	12.7
No	257 (49.0%)	17 (32.1%)	16.9
Don't Know	97 (18.5%)	12 (22.6%)	4.1
Missing Cases	8 (1.6%)	1 (1.9%)	

r = 0.03 P = 0.20

*Correct Response

Table 4 (Cont'd.)

5) Ribbon-Like Bowel Movements

	A	Css	Knowledge Change (%)
*Yes	115 (21.9%)	19 (36.5%)	14.6
No	236 (44.9%)	19 (36.5%)	8.4
Don't Know	175 (33.3%)	14 (26.9%)	6.4
Missing Cases	7 (1.4%)	2 (3.7%)	

r = 0.08 P = 0.02

6) Rectal Pain or Pressure

*Yes	199 (37.8%)	27 (50.9%)	13.1
No	249 (47.2%)	18 (34.0%)	13.2
Don't Know	79 (15.0%)	8 (13.2%)	0.1
Missing Cases	6 (1.2%)	1 (1.9%)	

r = 0.05 P = 0.09

*Correct Response

utilizing the Pearson r manipulation. In addition, per cent change in knowledge level varied from 14.6 - 26.9%. Two (2) items, Persistant Constipation and Rectal Pain or Pressure did not have significant Pearson r levels of less than 0.05.

High Risk Factor Responses of Pretest and Follow-Up Samples

The High Risk Factor items including the incidence of Colorectal Cancer by Age, Sex, Personal History, Family History and the Diagnosis of Ulcerative Colitis and Colorectal Polyps all had Pearson r significance levels less than 0.05. Per cent change in Knowledge levels varied from 11.7 - 32.3%. One (1) item, Incidence by Race, did not have a significant Pearson r level of less than 0.05. Table 5 depicts the High Risk Factor data.

Major Health Problem and Risk Perception by Age, Responses of Pretest and Follow-Up Samples

Correlations were also sought to identify the relationships between groups on Colorectal Cancer as a Major Health Problem, Perception of Self at Risk, and the Respondents' ages.

The item Colorectal Cancer as a Major Health Problem yielded a Pearson r of 0.182 and a significance level of 0.000 with an increased response of Yes by 29% from Pretest to Follow-Up testing.

The item Self at Risk yielded a Pearson r of 1.145 and a significance level of 0.0003 with an increase in perception of risk by 13.4% from Pretest to Follow-Up testing.

Table 5

Cross Tabulation for High Risk Factor Category

1) High Risk Factors

Age	A	Css	Knowledge Change (%)
20-29	16 (3.7%)	4 (7.5%)	3.8
30-39	71 (16.6%)	8 (15.1%)	1.5
*40-49	232 (54.3%)	35 (66.0%)	11.7
50-59	80 (18.7%)	4 (7.5%)	11.2
60 plus	28 (6.6%)	2 (3.8%)	2.8
Missing Cases	106 (21.2%)	1 (1.9%)	

r = 0.082 P = 0.036

2) Sex

More Males	144 (29.0%)	18 (33.3%)	4.3
More Females	22 (4.4%)	6 (11.1%)	6.7
*Both sexes equal	117 (23.6%)	21 (38.9%)	15.3
Don't Know	213 (42.9%)	9 (16.7%)	26.2
Missing Cases	37 (7.4%)	0	

r = 0.098 P = 0.010

3) Race

White	60 (12.2%)	4 (7.4%)	4.8
Black	12 (2.4%)	1 (1.9%)	0.5
Hispanic	2 (0.4%)	0	0.4
*All Races equal	139 (28.2%)	35 (64.8%)	36.6
Don't Know	280 (56.8%)	14 (25.9%)	30.9
Missing Cases	40 (8.0%)	0	

r = 0.035 P = 0.20

*Correct Response

Table 5 (Cont'd.)

4) Personal History of Cancer

	A	Css	Knowledge Change (%)
*Yes	193 (38.4%)	33 (62.3%)	23.9
No	109 (21.7%)	4 (7.5%)	14.2
Don't Know	201 (40.0%)	16 (30.2%)	9.8
Missing Cases	31 (6.2%)	1 (1.9%)	

r = 0.111 P = 0.004

5) Family History of Colorectal Cancer

*Yes	202 (39.8%)	36 (66.7%)	26.9
No	141 (27.8%)	4 (7.4%)	20.4
Don't Know	165 (32.5%)	14 (25.9%)	6.6
Missing Cases	25 (5.0%)	0	

r = 0.115 P = 0.003

6) Diagnosis of Ulcerative Colitis

*Yes	117 (23.3%)	30 (55.6%)	52.3
No	121 (24.1%)	2 (3.7%)	20.4
Don't Know	265 (52.7%)	22 (40.7%)	12.0
Missing Cases	30 (6.0%)	0	

r = 0.155 P = 0.0001

7) Diagnosis of Polyps

*Yes	160 (31.8%)	32 (60.4%)	28.6
No	118 (23.5%)	7 (13.2%)	10.3
Don't Know	225 (44.7%)	14 (26.4%)	18.3
Missing Cases	30 (6.0%)	1 (1.9%)	

r = 0.157 P = 0.0001

* Correct Response

In these two (2) items Missing Cases numbered 0 in Sample (Css) and 23-25 in Sample (A).

The items Self at Risk and Age 40 and over, a standard high risk variable, were extremely similar: (1) Sample (A) respondents were age 40 and over by 48.2%, (2) Sample (Css) respondents were age 40 and over by 48.1%, (3) Sample (A) respondents were under age 40 by 51.8%, and (4) Sample (Css) respondents were under age 40 by 51.9%.

(1) Sample (A) respondents age 40 and over indicated they perceived themselves to be at risk by 14.9%; 33.3% were inaccurate in their perception of risk by age.

(2) Sample (Css) respondents age 40 and over indicated they perceived themselves to be at risk by 28.3%; 19.8% were inaccurate in their perception of risk by age.

This represented a 13.5% improvement in perception of risk accuracy between samples for those at standard risk, age 40 and over.

(3) Sample (A) respondents under age 40 indicated they did not perceive themselves to be at risk by 40.1%; 11.7% were inaccurate in their perception of risk by age.

(4) Sample (Css) respondents under age 40 indicated they did not perceive themselves to be at risk by 49.1%; 2.8% were inaccurate in their perception of risk by age.

This represents an 8.9% improvement in perception of risk accuracy between samples for those not at standard risk, under age 40.

The group most accurate in their perception of risk were those who attended the educational program and who were not at risk by age, those under age 40. Refer to Table 6 for the Risk Perception Analysis.

Table 6

Cross Tabulation for Risk Perception

Major Health Problem

	A	Css	Change %
Yes	258 (50.6%)	43 (79.6%)	29.0
No	80 (15.7%)	7 (13.0%)	2.7
Don't Know	172 (33.7%)	4 (7.4%)	7.4
Missing Cases	23 (4.6%)	0	

r = 0.182 P = 0.0000

Self at Risk

Yes	76 (14.9%)	15 (28.3%)	13.4
No	204 (40.1%)	26 (49.1%)	9.0
Don't Know	229 (45.0%)	12 (22.6%)	22.4
Missing Cases	35 (5.0%)	0	

r = 0.145 P = 0.0003

Risk Perception by Age, (Standard Risk) and Perception

At Risk (Age 40 and Over)	48.2%	48.1%	0.1
Self at risk (yes)	14.9%	28.3%	13.4
Inaccurate risk Perception	33.3%	19.8%	13.5
Not At Risk (Under Age 40)	51.8%	50.9%	0.1
Self at risk (no)	40.1%	49.1%	9.0
Inaccurate risk Perception	11.7%	2.8%	8.9

Risk Perception and Demographic Variables The perception of self at risk was analyzed in each group (A) and (Css) in non-merged files to determine relationships on the basis of demographic variables. Chi Square and Pearson r were the statistics utilized for analysis. The six (6) demographic variables included Sex, Age, Race, Education, Occupation and Last Physician Visit. The Pearson r was significant at 0.05 level for sample (Css) on the variable Last Physician Visit only. The remaining five (5) demographic variables were insignificant statistically for both samples. Table 7 represents the relationships of each sample between risk perception and demographic variables.

Risk Perception and Mean Scores by Educational Components Since cross tabulations for risk perception were P = 0.05 or less in the earlier correlation analysis, further investigations were undertaken to determine relationships between risk perception and mean scores. Each sample was evaluated separately. The two (2) Educational categories were evaluated separately, and as a composite utilizing Analysis of Variance (ANOVA).

For the Signs and Symptoms Category the mean score of respondents (A) answering Yes to item Perceive Self at Risk was 2.47 (Base 6,00). The (Css) sample had a mean score of 2.60 (Base 6.00). Those responding No to the same item in Sample (A) had a mean score of 1.98 while Sample (Css) had a mean score of 3.81.

Table 7

Risk Perception and Demographic Variables
Pre and Post Programming

1) Sex	A Males	A Females	Css Males	Css Females
Yes	53 (10.4%)	23 (4.5%)	10 (18.9%)	5 (9.4%)
No	129 (25.3%)	75 (14.7%)	11 (20.8%)	15 (28.3%)
Don't Know	150 (29.5%)	79 (15.5%)	7 (13.2%)	5 (9.4%)
	Chi Square 1.05 2 Degrees of freedom P = 0.59		Chi Square 2.45 2 Degrees of freedom P = 0.29	
	r = 0.046 P = 0.36		r = 0.751 P = 0.29	

2) Age	A 20-29	A 30-39	A 40-49	A 50-59	Css 20-29	Css 30-39	Css 40-49	Css 50-59
Yes	8(1.6%)	25 (4.9%)	27 (5.3%)	14(2.8%)	3 (5.7%)	5(9.4%)	3(5.7%)	4 (7.5%)
No	34(6.7%)	80(15.7%)	56(11.0%)	31(6.1%)	8(15.1%)	4(7.5%)	5(9.4%)	9(17.0%)
Don't Know	36(7.2%)	81(15.9%)	62(12.2%)	41(8.1%)	3 (5.7%)	5(9.4%)	3(5.7%)	1 (1.9%)
	Chi Square = 7.36 10 Degrees of freedom P = 0.69				Chi Square = 5.24 6 Degrees of freedom P = 0.51			
	r = 0.021 P = 0.31				r = 0.106 P = 0.22			

*Age categories under 20 and over 60 comprised less than 3% in Sample (Css).

Table 7 (cont'd)
Risk Perception and Demographic Variables

3) Ethnic Origin	A White	A Black	A Other	Css White	Css Black	Css Other
Yes	70 (13.0%)	6 (1.2%)	0	14 (27.5%)	0	0
No	195 (38.6%)	8 (1.6%)	1 (0.2%)	22 (43.1%)	2 (3.9%)	1 (2.0%)
Don't Know	214 (42.4%)	9 (1.8%)	2 (0.4%)	10 (19.6%)	2 (3.9%)	0

A: Chi Square = 3.084, 4 Degrees of freedom, P = 0.54; r = 0.017, P = 0.35

Css: Chi Square = 3.555, 4 Degrees of freedom, P = 0.47; r = 0.163, P = 0.13

4) Education	A Grade School	A High School	A College (2 yr.)	A College (4 yr.)	A Post Grad.
Yes	0	47 (9.3%)	15 (3.0%)	8 (1.6%)	5 (1.0%)
No	0	138 (27.2%)	40 (7.9%)	18 (3.6%)	8 (1.6%)
Don't Know	9 (1.8%)	154 (30.4%)	34 (6.7%)	22 (4.3%)	9 (1.8%)
			Css		
Yes	0	12 (23.1%)	1 (1.9%)	0	2 (3.8%)
No	1 (1.9%)	15 (28.8%)	8 (15.4%)	2 (3.8%)	0
Don't Know	0	9 (17.3%)	2 (3.8%)	0	0

A: Chi Square = 4.208, 8 Degrees of freedom, P = 0.076; r = 0.074, P = 0.057

Css: Chi Square = 11.607, 8 Degrees of freedom, P = 0.17; r = 0.124, P = 0.19

Table 7 (cont'd)

Risk Perception and Demographic Variables

5) Occupation	A Supervisory	A Clerical	A Craft	Css Supervisory	Css Clerical	Css Craft
Yes	21 (4.2%)	12 (2.6%)	40 (8.0%)	5 (9.6%)	4 (7.7%)	6(11.5%)
No	61(12.2%)	50(10.0%)	90(18.0%)	7(13.5%)	10(19.2%)	8(15.4%)
Don't Know	63(12.6%)	47 (9.4%)	116(23.2%)	4 (7.7%)	4 (7.7%)	4 (7.7%)

Chi Square = 3.165
4 Degrees of freedom
P = 0.53

r = 0.011
P = 0.40

Chi Square = 0.790
4 Degrees of freedom
P = 0.94

r = 0.029
P = 0.42

6) Last Physician Visit

	A Within 1 yr.	A Within 1-2 yrs.	A Within 2-3 yrs.	A Over 3 yrs.	Css Within 1 yr.	Css Within 1-2 yrs.	Css Within 2-3 yrs.	Css Over 3 yrs.
Yes	47 (9.2%)	12(2.4%)	9(1.8%)	8(1.6%)	9(17.3%)	3 (5.8%)	0	3(5.8%)
No	127(25.0%)	38(7.5%)	17(3.3%)	22(4.3%)	18(34.6%)	7(13.5%)	0	0
Don't Know	139(27.3%)	45(8.8%)	20(3.9%)	25(4.9%)	8(15.4%)	4 (7.7%)	0	0

Chi Square = 1.305
6 Degrees of freedom
P = 0.97

r = 0.0005
P = 0.49

Chi Square = 8.062
4 Degrees of freedom
P = 0.089

r = 0.232
P = 0.049

Sample (A) had a F value of 1.134 with P = 0.32.

Sample (Css) had a F value of 1.834 with P = 0.17.

Therefore the Signs and Symptoms Category data were insignificant.

In the High Risk Factor Category the mean score of respondents (A) who answered Yes to item Perceive Self at Risk was 2.83 (Base = 7.00). The (Css) respondents' mean score for the same item was 3.87 (Base = 7.00). Those who responded No to the same item in the (A) sample had a mean score of 2.45 while the (Css) sample had a mean score of 4.77.

Sample (A) had a F value of 9.066 with P = 0.0001. This was considered very significant.

Sample (Css) had a F value of 3.163 with P = 0.05.

The two (2) categories were combined for a Composite Analysis of Variance. Now with a Base = 13.00 or 100%, Sample (A) respondents who indicated Yes to the perception of self at risk item scored a mean of 5.30 or 40.8% while Sample (Css) respondents had a mean score of 6.47 or 49.7%. Sample (A) respondents who indicated No to perception of self at risk scored a mean of 4.43 or 34.1% while Sample (Css) respondents had a mean score of 8.58 or 66.0%.

The F value for Sample (A) was 3.996 with P = 0.02.

The F value for Sample (Css) was 3.702 with P = 0.03. Both samples had significant levels for Composite Scores and Risk Perception relationships. Refer to Table 8 for ANOVA, Educational Categories Risk Perception

Table 8

ANOVA, Educational Categories by Risk Perception and Mean Test Scores Pre and Post Programming

	A	Css
Signs and Symptoms (6.00)		
Entire Population	2.10	3.19
Yes	2.47	2.60
No	1.98	3.81
Don't Know	2.09	2.58
	F = 1.134	F = 1.834
	P = 0.32	P = 0.17
High Risk Factors (7.00)		
Entire Population	2.26	4.09
Yes	2.83	3.87
No	2.45	4.77
Don't Know	1.90	2.92
	F = 9.066	F = 3.163
	P = 0.0001	P = 0.05

	A		Css	
Composite Total (13.00)	Mean Score	Test Percent	Mean Score	Test Percent
Entire Population	4.36	33.6	7.28	56.0
Yes	5.30	40.8	6.47	49.7
No	4.43	34.1	8.58	66.0
Don't Know	3.99	39.7	5.50	42.3
	F = 3.996		F = 3.702	
	P = 0.02		P = 0.03	

and Mean Test Scores Pre and Post Programming.

Risk Perception and Mean Scores A second analysis was performed involving Risk Perception and Mean Test scores. This analysis included only those respondents who answered Yes or No to the Risk Perception item; all Don't Know responses were excluded. The objective was to evaluate mean test scores, or Knowledge, of the Pre (Sample (A)) and Post (Sample (Css)) Program respondents by their perception of risk, Yes or No. Sample (A) respondents with a positive risk perception, response Yes, scored 5.30 (40.8%). Sample (A) respondents with a negative risk perception, response No, scored 4.42 (34.0%). Sample (Css) respondents with a positive risk perception, response Yes, scored 6.47 (49.8%). Sample (Css) respondents with a negative risk perception scored 8.58 (66.0%). The Main Effects were as follows:
(1) Perception of Risk d.f. = 1 F = 1.07 P = 0.30.
(2) Pre (A) and Post (Css) d.f. = 1 F = 29.26 P = 0.00.
The Interaction of Perception of Risk and Time Pre (A) and Post (Css) Mean Scores were d.f. = 1 F = 6.20 and P = 0.01. The exclusion of the Don't Know response was performed to achieve more reliable data. The exclusion resulted in reduced sample cell sizes. The Sample (A) total was N = 280 with Yes respondents N = 76 and No respondents N = 204. The Sample (Css) total was N = 41 with Yes respondents N = 15 and No respondents N = 26. Refer to Table 9 ANOVA, Risk Perception by Mean Test Scores Pre and Post Programming. By time Post-Programming scores were

Table 9

ANOVA, Risk Perception by Mean Test Scores
Pre and Post Programming

		Pre (A)	Post (Css)	Total
Perceived Risk	Yes	5.30(40.8%) N = 76	6.47(44.8%) N = 15	5.49 N = 91
	No	4.43(34.0%) N = 204	8.58(66.0%) N = 26	4.89 N = 230
	Total	4.66 N = 2.80	7.80 N = 41	Grand Mean 5.07 Grand Total 321

Main Effects:

Perception of Risk — Degrees of freedom = 1
F = 1.07
P = 0.30

Pre (A) and Post (Css) — Degrees of freedom = 1
F = 29.26
P = 0.00

Interaction:

Perception of Risk and Pre (A) and Post (Css) Mean Scores
Degrees of freedom = 1
F = 6.20
P = 0.01

higher than Pre-programming scores but higher scores were achieved by those with a negative perception of risk than those with a positive perception of risk in the Post-programming sample.

The latter was an unexpected outcome. The highest scores achieved by those with a negative risk perception cannot be easily explained. The hypothesis indicated that those who perceived themselves to be at risk would have significantly higher test scores. The hypothesis must clearly be rejected.

Age and Mean Scores Age was also investigated for relationships of mean scores. No significant data was obtained for the Signs and Symptoms or High Risk factor categories, or the Composite categories. However, the mean test scores decreased as age increased in all age categories except those aged 40-49 had slightly lower scores than those aged 50-59 in Sample (A) only. Also Sample (Css) respondents in the 40-49 age category scored lower than those in the 20-29 and 30-39 age categories. Sample (Css) participants were all aged 20-59. (Css) mean scores as a Composite were 7.28. Sample (A) had respondents represented in all age categories. Their Composite mean score was 4.25. Table 10 depicts the insignificant analysis of the two categories Signs and Symptoms and High Risk Factors and the Composite mean scores for both groups and all age categories.

Cancer Information-Sources and Mean Scores It was of interest to determine the participants cancer information

Table 10

ANOVA

Age and Mean Test Scores Pre and Post Programming

Signs and Symptoms (6.00)	A	Gss
Entire Population	2.08	3.17
Under 20	3.00	--
20-29	2.43	3.07
30-39	2.30	3.21
40-49	1.71	3.36
50-59	1.95	3.07
Over 60	1.54	--
	F = 1.578	F = 0.043
	P = 0.16	P = 0.99
High Risk Factors (7.00)		
Entire Population	2.18	4.11
Under 20	2.00	--
20-29	2.48	4.43
30-39	2.26	4.50
40-49	2.12	3.82
50-59	1.99	3.67
Over 60	1.15	--
	F = 1.466	F = 4.88
	P = 0.20	P = 0.69
Total (13.00)		
Entire Population	4.25	7.28
Under 20	5.00	--
20-29	4.90	7.50
30-39	4.56	7.71
40-49	3.83	7.18
50-59	3.93	6.73
Over 60	2.69	--
	F = 1.92	F = 0.187
	P = 0.089	P = 0.90

sources and their relationship between Pretest mean scores. Analysis of Variance was again utilized. The sources indicated were Last Company Program, Company, Company Safety Meeting, American Cancer Society, American Cancer Society Movie, Physician, Literature, Television, and Newspaper. Responses with five (5) or less per category, Absolute Frequency, were not considered in the analysis. These sources were school, Red Cross, family member with medical training, family member with cancer, and victim. These totalled 18 responses.

The Rochester Telephone Company sponsored a similar program 18 months prior to this Colorectal Cancer Screening and Education Program.

The categories which included company were divided into Last Program, Company, and Company Safety. The American Cancer Society (ACS) category was further subdivided into (ACS) movie. (ACS) was the agency involved in the last company program. Their film was also a part of that educational presentation. It was decided to maintain each category as a single unit for this analysis. The responses sought were those that were last recalled indicating the impression of the respondent. Some 52% of the (A) population did not indicate a cancer information source. This group had a Composite mean score of 3.66 (28.1%).

Table 11 Sources of Cancer Information and Employee Scores includes a listing of each category, number of responses, percent of the population represented and their scores by Signs and Symptoms and High Risk Factor categories and the Composite. It also includes a percent (%) mean test score.

The F value for the Signs and Symptoms mean score category was 2.31 with a P = 0.01.

The F value for the High Risk Factor mean score category was 2.93 with a P = 0.002.

The F value of the Composite mean score was 3.27 with P = 0.007.

All F values were considered very significant.

The three (3) company categories represented 11.33% of the 48% who responded. Composite mean score (Base = 13.00) varied from 3.88 - 5.90 (29.7 - 45.4%).

The two (2) (ACS) categories represented 0.08% of the 48% who responded. Composite mean score (Base = 13.00) were 5.85 and 5.37 (45.0% and 41.3%) The film category was the lower of the two but consisted of 8 responses.

The Physician category represented 0.06% of the responses and a Composite score of 5.28 (40.7%).

The literature and television categories represented a combined response of 0.05% and had a Composite mean score of 4.76 and 4.80 (36.7% and 37.0%).

The newspaper category represented 0.02% of the re-

Table 11

Sources of Cancer Information and Employee Mean Scores

Sources	Number of Responses	Percent of Total Pop.	Mean Score* Signs and Symptoms	Mean Score* High Risk Factors	Mean Score* Composite	Test Score %
Last Company Program	47	9.0	2.57	2.55	5.13	39.4
Company	66	1.3	1.63	2.24	3.88	29.7
Company Safety Meeting	20	0.03	3.00	2.90	5.90	45.4
ACS	34	0.07	2.73	3.12	5.85	45.0
ACS (Movie)	8	0.01	3.00	2.37	5.37	41.3
Physician	32	0.06	2.53	2.75	5.28	40.7
Literature	17	0.03	2.59	2.18	4.76	36.7
Television	10	0.02	3.20	1.60	4.80	37.0
Newspaper	10	0.02	0.90	1.90	2.80	21.6
Other sources	18	0.03				
None given	271	52.0	1.80	1.86	3.66	28.1
N = 533	Total	100.00	Average 2.06	Average 2.16	Average 14.22	Average 32.5
			F = 2.31 P = 0.01	F = 2.93 P = 0.002	F = 3.27 P = 0.007	

*Mean Score Signs and Symptoms Base = 6.000
*Mean Score High Risk Factor Base = 7.000
*Mean Score Composite Base = 13.000

sponses. The Composite mean score was 2.80 (21.6%). The newspaper source was the lowest scoring category, even lower than the respondents' scores who did not indicate a source.

The Screening Program and Employee Participation

The Rochester Telephone Company employed 2306 individuals in 1981. Approximately 54% (1249) were considered standard high risk for Colorectal cancer or age 40 and over. All employees were allowed to attend the education program on company time. Those that attended the education program numbered 728 (32%). Approximately 31% (387) who attended the education program were at standard risk, age 40 and over. The consent form was signed by 677 (93%) of those who attended the program. The Hemoccult Test was completed by 237 individuals representing 33% of those who attended the program, and 10% of the total employee population. The Hemoccult Test was completed by 172 (44%) who were standard high risk by age. The Hemoccult Test results included three (3) positives (1.3%). Laboratory test results were reported as positive, negative or trace for each of the three (3) specimens per kit. The test findings for the three (3) cases were as follows: Case 1 Trace-Trace-Negative, Case 2 Trace-Trace-Negative and Case 3 Trace-Negative-Negative. All three (3) cases were male aged 46, 35, and 53. All three (3) cases were seen by their physicians within 7-11 days after notification of positive results. All three (3) physicians completed

Table 12

Industrial Employee Participation in a Colorectal Cancer Screening Program

Employees		Age 40 and Over
Management	606	359
*RTC Union	738	288
*CWA Union	962	602
Total	2306 (100%)	1249 (54%)

Attended Education Program	Age 40 and Over
728 (32%)	387 (31%)

Signed Consent Form	
677 (93%)	---

Completed Hemoccult Test		
Attended the Program	237 (33%)	172 (44%)
Total Population	(10%)	(14.0%)

Positive Hemoccult Test		
	3 (1.3%)	2 (0.8%)

Hemoccult Test Findings

Case 1	Trace	Trace	Negative	Male 46
Case 2	Trace	Trace	Negative	Male 35
Case 3	Trace	Negative	Negative	Male 53

Further Diagnostic Testing			Findings	Treatment
Case 1	Barium Enema	Sigmoidoscopy	Normal	None
Case 2	Barium Enema	Sigmoidoscopy	Normal	None
Case 3	Barium Enema	Sigmoidoscopy	Normal	None

*RTC Rochester Telephone Company
*CWA Cable Workers Association

a follow-up letter which indicated a Barium Enema and Sigmoidoscopy were performed with normal findings and no treatment was required. Refer to Table 12, Industrial Employee Participation in a Colorectal Cancer Screening Program.

Program Costs

The program cost totalled $6,727.25. Cost figures included advertising services for the design and graphics developed for the payroll insert and poster by the Communication Center at the State University of New York College at Brockport ($300.000). Clerical services were provided by the Rochester Telephone Company ($30.00). The Highland Hospital Clinical Laboratory Director estimated their services based on a technician's hourly rate at $7.00 requiring 19.75 hours to complete testing ($138.25). The 500 Hemoccult test kits, purchased through the (ACS), were $0.58 each ($290.00). The speakers each valued themselves on an hourly basis ($327.00). The cost of their time and gasoline mileage to and from work sites, branch offices, were not included. The cost to the employer ($5,642.00) was based on an average hourly rate for all employees ($10.34), average presentation (45 minutes) and number of employees attending (728). Refer to Table 13 for Colorectal Cancer Education and Screening Program Costs.

Table 13

1981 Colorectal Cancer Education and Screening Program Costs

Advertising Graphic Services		$ 300.00
Clerical Services		30.00
Hospital Laboratory Services (247 Tests)		138.25
Hemoccult Test Kits (500)		290.00
Speakers for Education Presentation		327.00
Employer Costs		5642.00
Average Hourly Rate	$10.34	
Average Presentation	45 minutes	
Employees Attending	728	
Total Program Cost		$6727.25

Cost of One Colorectal Cancer Case

Costs were also considered for an in-hospital diagnostic evaluation and surgical treatment of one (1) localized Colorectal Cancer Case. The purpose of the study was to compare the costs of a Colorectal Cancer Educational and Screening Program with the cost of a colorectal cancer case. The study was undertaken in May 1981 by an Administrative Assistant in the Patient Accounts Office at Strong Memorial Hospital, University of Rochester Medical Center. Diagnostic testing alone was $350. The average hospital stay was 12 days, based on five (5) cases and included a semi-private room at $192.00 per day. The total hospitalization cost was $3,005.00. Additional physicians' fees were $723.50. The total hospitalization and fees amounted to $4,078.50. Refer to Table 14 for the complete fee listing. The cost study was limited to in-hospital patient charges and did not include follow-up discharge care or indirect costs.

Summary

The purpose of this study was to evaluate the impact of a Colorectal Cancer Education Program on an asymptomatic industrial population. It was hypothesized that risk perception and age would be significant variables upon evaluating level of knowledge.

The initial overall mean test scores of Sample (A), the Pretest group, were 4.25 (32.7%). The mean scores of the

Table 14

Cost of an In-Hospital Diagnostic Evaluation and Surgical Treatment of a Localized Colorectal Cancer Case

Description	Fee
Sigmoidoscopy	$ 21.00
Long Colonoscopy	79.00
Barium Enema	65.00
Gall Bladder Series	34.00
Hemoccult Test	6.00
Metastatic Survey	
Bone	56.00
Small Bowel	56.00
Electrocardiogram	33.00
Diagnostic Test Total	$350.00
Semi-Private Room (1 day)	192.00
Average 5 Cases (12 days)	2304.00
Operating Room Time 2 hours	574.00
Anesthesiology Fee (Drugs)	50.00
Recovery Room Fee	77.00
Hospitalization Total	$3005.00
Physicians' Fees	
Surgeon	476.00
Anesthesiologist 2 hours	247.50
Physicians' Fees Total	$ 723.50
Diagnostic Test	350.00
Hospitalization	3005.00
Physicians' Fees	723.50
Final Total	$4078.50

Source: Linda Badami, Administrative Assistant
Patient Accounts Office, Strong Memorial Hospital
The University of Rochester Medical Center
Rochester, New York

Sample (Css), the follow-up group were 7.28 (56.0%), F = 1.06, Two-Tailed Probability = 0.73, t Value for Separate Variance Estimate = 5.80 with d.f. = 63.57, Two-Tailed Probability = 0.000. The value of the Educational Program has been demonstrated by a significant increase in knowledge of the participants. Refer to Table 3.

An analysis was undertaken involving risk perception and mean scores utilizing ANOVA. Only respondents who answered Yes or No were included. The sample sizes were reduced considerably. Grand Total = 321. N Sample (A) = 280. N Sample (Css) = 41. Mean Scores were as follows: Sample (A) Yes = 5.30, Sample (A) No = 4.42, Sample (Css) Yes = 6.47, Sample (Css) No = 8.58. The Main Effects of Risk Perception were d.f. = 1, F = 1.07 and P = 0.30. The hypothesis indicating that respondents with positive Risk Perception, the Yes response, would have significantly higher test scores must be rejected. The sub-sample with negative Risk Perception, the No response, had the highest test score. The reason for this unexpected outcome cannot easily be explained. Refer to Table 9.

The variable age was also analyzed utilizing ANOVA to evaluate Knowledge. Each sample was evaluated separately in non-merged files. No respondents were excluded in the Risk Perception item. The Composite values for Sample (A) were F = 1.92 and P = 0.089. The Composite values for Sample (Css) were F = 0.187 and P = 0.90. It

had been hypothesized that respondents age 40 and over, a standard high risk variable, would have higher test scores. The expected outcome was that as age increased and therefore risk, mean scores would increase. A trend was evidenced which was the reverse of the expected: As age increased mean test scores decreased in both sample populations. Refer to Table 10. The hypothesis that as age increases knowledge increases must clearly be rejected.

The analysis of colorectal cancer information sources proved to be of interest. Refer to Table 11. Over one-half (52%) of the Sample (A) respondents did not complete the questionnaire item. This group had a mean score of 3.66 or (28.1%). There were nine (9) categories of responses. Three (3) were Company categories with the most specific source, Company Safety Meeting, scoring the highest mean score of 5.90 (45.4%). There were two (2) American Cancer Society categories; the more general category, American Cancer Society, had the second highest ranking mean score of 5.85 or (45.0%). The Physician category ranked third with a mean score of 5.28 or (40.7%). Literature as a source ranked seventh with a mean score of 4.76 or (36.7%); the Newspaper category ranked lowest, even lower than no source, with a mean score of 2.80 or (21.6%).

As indicated in Table 12 the screening portion of the data analysis evidenced that 728 (32%) of the entire

employee population 2306 (100%) attended the educational program; 387 (31%) of the age 40 and over population (1249) attended the educational program. Of those who attended 677 (93%) signed consent forms to participate in the screening portion of the program; 237 (33%) actually completed the test (10% of the total employee population). The group age 40 and over numbered 172 (44%) of those attending the educational program (387). Three (3) (1.3%) positive Hemoccult Tests resulted. All three (3) cases were evaluated by their private attending physicians with a Barium Enema and Sigmoidoscopy indicating normal findings.

Total program costs included advertising, clerical services, hospital laboratory services, the Hemoccult Test Kits, speakers for the educational presentations and employer costs. As indicated in Table 13, total Educational and Screening costs were $6,727.25. The major costs were to the employer at $5,642.00.

To evaluate the cost of cancer and to serve as a cost comparison for the educational and screening program a study was undertaken to estimate the cost of one (1) case of localized colorectal cancer for an in-hospital diagnostic evaluation and surgical treatment. The data were collected in the Rochester area by a Patients Accounts Administrative Assistant at the University of Rochester Medical Center. As listed in Table 14 Diagnostic costs totalled $350, hospitalization costs totalled $3005 and physicians' costs totalled $723.50. The final total was

$4078.50. The total was based on an average hospital stay of twelve (12) days. Other direct costs such as follow-up care, medicines and therapy were not considered for this analysis. Also indirect costs to the employer such as disability payments and temporary replacement services were not included.

Chapter 5
Data Evaluation
Interpretations, Conclusions and Recommendations

Introduction

The measure of success remains difficult to determine when evaluating Health Education and screening programs. This Colorectal Cancer Program was certainly no exception. The problem is surely not new to health educators. In seeking that measure of success tangible data became available through this study relative to the health education area, risk perception and participation in such programming.

Sample Size

The sample sizes of this study were admittedly disproportionate. The Pretest Samples (A) represented 90.80% of the study while the Follow-up Sample (Css) represented 9.22% of the study. Due to asymmetry among questionnaires only data from Samples (A) and (Css) could be compared. The exclusion of all Sample (B) responses with the exception of demographic variable items was therefore necessary. The exclusion of certain responses from Sample (C) was necessary after it became evident some of these respondents did not complete the Pretest and/or did not attend the educational program. The sample size was reduced considerably to attain a valid population. As with similar studies of this type, the major threats to validity include that of a self-selected sample population and attrition.

Instruments

As previously indicated the questionnaires were asymmetrical in item format. The data utilized included all Pretest, Sample (A), responses, only Posttest, Sample (B), demographic variable responses and only Follow-up Sample (C) responses, when participation was indicated in both the educational and screening portions of the program, designated as (Css). The cancer educational question items on Questionnaires A and C were subjected to a Reliability Analysis which evidenced two (2) items with negative Alpha Levels. After deletion of these two (2) items the Alpha Level was considered highly reliable at 0.85 for the remaining thirteen (13) items.

Demographic Profile

The Demographic Profile of the Rochester Telephone Company Employees as indicated by responses received from instruments A, B, and C included the following: the individual was most frequently male, aged 30-49, white, high school educated and a Craftsman by occupation. (Sample (Css) respondents evidenced a fairly equal distribution of all three (3) occupational categories designated as Management, Clerical, or Craftsman).

Past Participation Profile

Included in the Participation Profile were variables (1) Last Physician Visit, (2) Participation in any Colorectal Cancer Screening Program, (3) Tested for Colorectal Cancer in the Last Year, and (4) Tested with the Hemoccult Test.

Refer to Table 1. Sample (Css) respondents indicated by 67% that they had seen their physician in the last year, by 73.1% that they had previously participated in a Colorectal Cancer Screening Program, by 63% that they had been tested in the last year and by 50.9% that they had experience with the Hemoccult Test. The following trend was evidenced by both Samples (A) and (B): 61.9% were seen by their physician in the last year, 30.6% had previously participated in a Colorectal Cancer Screening Program, 17.2% were tested in the last year and 18.9% had experience with the Hemoccult Test. Several conclusions are possible from these data. In all three (3) samples the mean age was 35; 52% were not at risk by age. The physician either performed the test without the patient's knowledge, did not perform the test or request the patient to perform the test at home.

Sample (A) respondents indicated they had seen a physician in the last year by 61.9% and yet only 17.2% indicated they had been tested in the same period. By age, 48% of that same sample were at standard risk, yet 44.0% of that sample were <u>not</u> tested (17.2 - 61.9 = 44.7).

Sample (Css) respondents indicated by 67.0% that they had been seen by a physician in the last year and by 63.0% that they were tested in the last year. Again by age, 48% were at standard risk, but only 4% of that sample were not tested (63 - 67 = 4).

Winawer[1] reported the results of a Public Awareness Survey indicating that 52.4% of those polled see their physicians for an annual health examination. He further indicated that 29% were self-motivated or they visited their physician without experiencing symptoms or requiring a physical examination.

Perhaps it is more significant that a pattern appeared to be unfolding suggesting previous participation in a screening program, previous testing in the last year and familiarity with the Hemmoccult Test. All seemed to increase participation in the screening program.

The physician contact seemed to hold relative importance in two (2) other areas.

Risk perception and six (6) demographic variables were analyzed utilizing the Pearson Product Moment and Chi Square manipulation. Refer to Table 7. In Sample (Css) the correlation of Risk Perception and Last Physician Visit was the only variable with a Significance Level less than 0.05 utilizing the Pearson Product Moment statistical manipulation.

Secondly, Pretest respondents were requested to indicate their Colorectal Cancer information source. Physician was the third most frequent response (32/262). This response group also had the third highest mean test score (40.7%). Refer to Table 11.

[1]Winawer, Screening for Colorectal Cancer, Gastroenterology 70 (1976), p. 788.

Present Participation Profile

The total industrial population numbered 2306 (100%); 1249 (54%) were age 40 and over, or at standard high risk. Those who attended the educational program numbered 728 (32%) of the total 2306; 387 (31%) were of the standard high risk group (1249). Some 677 (93%) of those attending (728) signed a consent form. Those that completed the test numbered 237; (33%) of those attending the program (728), and 10% of the total population (2306). Employees who were standard high risk numbered 172 (44%) of those attending (387). The Positive Hemoccult Test results numbered three (3); two (2) were standard high risk, age 40 and over. All three (3) cases were subsequently evaluated by their physician with Barium Enema and Sigmoidoscopy indicating normal findings. The false positive rate was 1.3%. Refer to Table 12.

Participation rates and false positive rates as indicated by other studies varied considerably. The participation rate indicated in the Lieberman Study[2] findings was 28.7%; the false positive rate was 3.2%.

Another point of interest is that 93% of those who attended the educational program signed a consent form, yet only 33% actually completed the test. The answer remains speculative regarding this dramatic attrition. Perhaps

---

[2]Lieberman Research Incorporated, "A Study of Alternative Means of Inducing People to do the Hemoccult Test," American Cancer Society (New York 1975), p. 7.

the dietary instructions or the time committment was a barrier. Perhaps the actual signing of the consent form was merely a response to a group norm. Further investigation is warranted in this area.

Of those participating in both the Educational and Screening portions of the program, Sample (C) indicated their reason for participation was by 24% that it was important. The remaining responses for participation included 12% High Risk, 12% easily self-administered, 12% privacy of home testing, and 10% other. This item was unanswered by 7.6%. Those not participating in the program indicated their reasons as follows: 25.0% not at High Risk, 18.8% Recent Examination, 6.3% unimportant, 6.3% Difficult Diet Instructions, 6.3% unpleasant, and 1.9% other. The item was unanswered by 37.5%.'

Evaluation of Colorectal Cancer Knowledge of Respondents

The major purpose of this study was to evaluate colorectal cancer knowledge of an asymptomatic industrial population before and after an educational program. The variables high risk, specifically age and personal perception of risk were the key componenets of this evaluation. The thirteen (13) items consisted of two (2) categories: Signs and Symptoms and High Risk Factors. The Signs and Symptoms category consisted of six (6) items valued at 6.00. The High Risk factor category consisted of seven (7) items valued at 7.00. The Composite of both categories was thirteen (13) items, valued at 13.00.

In the Signs and Symptoms category (6.00) the Pretest respondents scored a mean of 2.08 while the Follow-up respondents scored a mean of 3.17.

In the High Risk factor category (7.00) the Pretest respondents scored a mean of 2.18 while the Follow-up respondents scored a mean of 4.1.

The Composite mean score for the Pretest respondents was 4.25 (37.7%) while the Follow-up respondents' mean score was 7.28 (56.0%).

The Significance Levels were all less than 0.01 utilizing the t Test manipulation for Separate Variance Estimate. Refer to Table 3.

The overall increase in knowledge from Pretest to Follow-up Test was 18.3%. The educational portion of the program was considered successful.

Evaluation of Risk Perception and Knowledge

It was speculated that individuals who perceived themselves to be at risk for this cancer would have higher test scores than individuals who did not perceive themselves to be at risk pre and post educational programming. Firstly each sample and each educational testing component will be reviewed.

In the Signs and Symptoms category Pretest respondents who did perceive themselves to be at risk scored 2.47 while the Follow-up respondents scored 2.60. In the same category Pretest respondents who did not perceive themselves to be at risk scored 1.98 while the Follow-up

respondents scored 3.81. The Analysis of Variance manipulation was applied. Data analysis indicated this manipulation was insignificant at the 0.05 level.

In the High Risk factor category the Pretest respondents who did perceive themselves to be risk scored 2.83 while the Follow-up respondents scored 3.87. ANOVA was again utilized. The Significance Level was 0.0001. In the same category the Pretest respondents who did not perceive themselves to be at risk scored 2.45 while the Follow-up respondents scored 4.77. The Significance Level was 0.05.

In the Composite the Pretest respondents who did perceive themselves to be risk scored 5.30 (40.8%) while the Follow-up respondents scored 6.47 (49.7%). The Significance Level was 0.02. Pretest respondents who did not perceive themselves to be at risk scored 4.43 (34.1%) while the Follow-up respondents scored 8.58 (66.0%). The Significance Level was 0.03.

Utilizing this data the Significance Levels were acceptable at the less than 0.05 level for the Composite Test Scores of Pre and Follow-up respondents in the Risk Perception category.

A second analysis was undertaken to evaluate mean scores by risk perception utilizing ANOVA with merged files and deleting all Don't Know responses to the risk perception item. Refer to Table 9. Deletion of Don't Know responses reduced sample size considerably. The Grand Total was N = 321. However, the most significant responses were the

Yes and No responses. The Sample (A) or Pretest group with Yes responses scored 5.30 (40.8%) N = 76. The Sample (A) group with No responses scored 4.42 (34.0%) N = 204. The Sample (Css), or Posttest group, with Yes responses scored 6.47 (49.8%) N = 15. The Sample (Css) with No responses scored 8.56 (66%) N = 26. The significance levels were greater than 0.05 by risk perception. These data were the basis for rejecting the hypothesis that positive risk perception correlated with increased knowledge. Further studies to investigate this phenomenon are worthy of consideration. It was not expected that respondents with negative perception of risk would be the highest scoring group.

Evaluation of Age and Knowledge

Age 40 and over was considered to be a standard High Risk Factor. It was speculated that as age increased test scores would also increase. In both categories as well as the Composite, again utilizing ANOVA, Significance Levels were greater than 0.05. The hypothesis must be rejected. It was interesting to note that the general trend was the reverse: test scores decreased with age. Refer to Table 10.

As indicated in the Evaluation of Risk Perception and Knowledge, the mean test scores were highest in the group which did not perceive themselves to be at risk and also the not at risk population, age under 40, which comprised over 50% of the total sample populations. Both

the Risk Perception and Knowledge Analysis, and Age and Knowledge Analysis have similar findings. The Not at Risk group, under age 40, had the higher test scores. It can be concluded that as age increased Knowledge decreased. Future programming emphasis should be directed toward the age 40 and over higher risk population.

Evaluation of Cancer Information Sources and Knowledge

Pretest respondents were requested to indicate their source of Colorectal Cancer information. These sources and mean test scores were analyzed utilizing ANOVA. A total of nine (9) categories were represented (48%): (1) Company (1.3%), (2) Company Safety Meeting (0.03%), (3) Last Program (9.0%), (4) American Cancer Society (0.07%), (5) their film, "The Cancer No One Talks About," (0.01%), (6) Physician (0.06%), (7) Literature (0.03%), (8) Television (0.02%), (9) Newspaper (0.02%). It was of interest that 52% did not respond with a source. Those that were more specific in their company source scored a mean of 5.13 (39.4%) and 5.90 (45.4%). The general Company category respondents scored 3.88 (29.7%). The ACS and the film category respondents scored 5.85 (45.0%) and 5.37 (41.3%). The Physician category respondents scored 5.28 (40.7%). The Literature and Television category respondents' scores were similar: 4.76 (36.7%) and 4.80 (37.0%). The Newspaper category respondents scored lowest 2.80 (21.6%), indicating the newspaper is a poor source of information at least for colorectal cancer.

It can be concluded the newspaper is either not a valid source of information or that respondents did not understand the written information communicated.

The 52% who did not respond to this questionnaire item scored 3.66 (28.1%). Those who did not respond apparently received cancer information. Why over one-half of the Pretest sample did not respond remains speculative. The item was an open-ended question, not Multiple Choice. Perhaps they were unable to specify one source alone.

The Significance Levels for the Signs and Symptoms and the High Risk Factor categories and the Composite were 0.01 or less.

The higher test scores were of those respondents who indicated company and ACS. Recall that a past program co-sponsored by ACS was offered eighteen (18) months prior. The justification of such programming in an industrial setting is apparent: individuals who indicated the Company or ACS were the most knowledgable regarding this cancer. It would be remiss to not site the role of the physician as healer as well as educator. These respondents ranked third in highest mean scores. The physician has and hopefully will play a more important role as an educator, as a more thorough evaluator in testing and also as an inspiror to encourage patients to participate in screening programs. More intensive, repetitive physician directed information dissemination may assist in achievement of that goal.

Evaluation of Risk Perception Accuracy By Age

Both sample populations indicated by 48% that they were 40 and over. Pretest respondents perceived themselves to be at risk by 14.9%; 33.3% were inaccurate by age. Follow-up respondents perceived themselves to be risk by 28.3%; 19.8% were inaccurate by age. The percent increase in accuracy of perception was 13.4%.

Both sample populations indicated they were under age 40 by 52%. The Pretest respondents did not perceive themselves to be at risk by 41.1%; 11.7% were inaccurate by age. The Follow-up respondents did not perceive themselves to be at risk by 49.1%; 2.8% were inaccurate by age. The percent increase in accuracy was 8.9%.

It must be stressed that age was the only measure of high risk perception employed in this analysis. Those individuals (2.8%), in the Follow-up sample, may have been diagnosed with Ulcerative Colitis or Diverticulitis. The remarkable findings were percent changes: 13.4% were more accurate in their positive perception of high risk and 8.9% were more accurate in negative perception of high risk for developing Colorectal Cancer. It may be concluded that (1) more high risk individuals had a better perception of awareness for developing Colorectal Cancer, (2) individuals who were not at risk for Colorectal Cancer have been relieved of anxiety regarding developing this cancer.

Program Costs

The Colorectal Cancer Education and Screening Programs costs included: advertising graphic services, clerical services, hospital laboratory services, speaker services as well as the Hemoccult Test Kits and the Employer costs. The total cost was $6,727; the major portion was the cost to the employer ($5,642). Based on the number who attended the program (728) it cost $9.24 per employee.

In-Patient Diagnostic and Treatment Costs

The fees for an in-hospital diagnostic evaluation of a localized case of colorectal cancer included the tests e.g. Sigmoidoscopy, Barium Enema, Hemoccult Test, Electrocardiogram, etc. A Diagnostic Evaluation totalled $350. The hospitalization and surgical treatment costs totalled $3,005. Physician fees totalled $723.50. The fees were based on an average of five (5) cases. Patients occupied semi-private rooms. Hospital stays averaged twelve (12) days. The total cost to diagnose and treat one patient with a localized colorectal malignant tumor was $4,078.50 in the Rochester Area. Since it was assumed that the tumor was localized and excised intact no Chemotherapy or Radiation Therapy fees were considered.

It was worth noting that the Hemoccult Test fee was listed as $6.00 in the hospital. Yet the entire Colorectal Cancer program with the educational and screening segments cost $9.24 per employee.

The cost studies were far from comprehensive in comparison to Eddy's[3] Cost Study. He considered employer labor costs and other indirect costs to employers as well as post discharge costs, e.g., follow-up visits, drugs, etc.

The missing cost is that of human suffering, for which no one has attempted to set a monetary value.

Specific Conclusions: As each portion of this study was reviewed conclusions were indicated. The following is a summary of these conclusions:

(1) The physician holds relative importance in three areas: Risk Perception, Colorectal Cancer Information Source and Screening Program Participation. (2) The most knowledgeable Pretest respondents were those who indicated Company Safety Committee and the American Cancer Society. The most valuable information sources were, therefore, industry and the sponsoring agency. (3) The least knowledgeable Pretest respondents were those who indicated newspaper. The least valuable information source, at least for Colorectal Cancer, is the newspaper. (4) The most Knowledgeable Posttest respondents were those who were under age 40 and who did not perceive themselves to be at risk. (5) The overall trend was that as age increased knowledge decreased regarding this cancer. (6) Posttest respondents scored higher in the High Risk Factor category than in the Signs and Symptoms category. (7) The cost per employee for the Education and Screening

[3]David Eddy, "The Economic Impact of Cancer and Cancer Controls on Private Industry" American Cancer Society National Public Education Committee Presentation, June 17, 1981. p.3.

program was $9.24; the cost per in-hospital Hemoccult Test was $6.00.

Recommendations: In view of the limitations and findings of this study it is recommended that further research be conducted along the following lines: (1) Although the written communications promoting the program were sophisticated, timely and appealing, a more aggressive campaign may have had a greater impact on the participation rates. Small groups limited to 30 persons, more personal contact with follow-up by Health and Safety Representatives, larger posters and written support in the company newsletter, are suggestions. (2) Physicians should be more actively included in information dessmination campaigns to enhance their role as educator and diagnostician for the At Risk Population. (3) The sponsoring agency should (a) direct information to the age 40 and over At Risk Population, (b) place greater emphasis on Signs and Symptoms of Colorectal Cancer, and (c) rely less on the newspaper as an accurate source of information dessimation. (4) Industry has been demonstrated to be a valuable learning resource center for employee health education and screening programs. (5) A reward system may be an effective method of increasing participation in employee health education and screening programs. Rewards for participants may take the form of reduced health insurance premiums, employer contributions to Retirement Plans, profit sharing in company stock on a point system basis, or monetary incentives such as employer matched payroll savings for one month.

BIBLIOGRAPHY

1. Books

Hall, C., Hadlai, and Nile, Norman H., SPSS Update, New York: McGraw Hill, 1979.

Lininger, Charles, and Warwick, Donald. The Sample Survey: Theory and Practice. McGraw Hill Incorporated, 1975.

Marshall, Carter, L. Toward an Educated Consumer: Mass Communication and Quality in Medical Care. United States Department of Health Education and Welfare. Public Health Service National Institute of Health. Washington, D.C.: United States Government Printing Office, 1977.

2. Booklets

American Cancer Society. "1981 Cancer Facts and Figures," New York: American Cancer Society, 1980, pp. 1-31.

American Cancer Society. "Developing a Colorectal Cancer Education Program," New York: American Cancer Society, 1977, pp. 1-18.

American Cancer Society. "Teaching About Cancer--A Guide to Source Material and Information," New York: American Cancer Society, 1975, pp. 1-37.

Garfinkel, Lawrence; Poindexter, Cyril; and Silverburg, Edwin. "Cancer Statistics, 1980," New York: American Cancer Society, 1980, pp. 23-44.

Lieberman Research Incorporated. "Alternative Means of Inducing People to do the Hemoccult Test," New York: American Cancer Society, 1975, pp. 1-12.

Lieberman Research Incorporated. "Public Attitudes Toward Cancer and Cancer Tests," New York: American Cancer Society, 1980, pp. 92-98.

"Pretesting in Health Communications-Methods, Examples, and Resources for Improving Health Messages and Materials," Bethesda, Maryland: United States Department of Health and Human Services, 1980, pp. 1-45.

3. Periodicals

Alcantera, Emorita and Speckman, N. Elwood. "Diet, Nutrition and Cancer," American Journal of Clinical Nutrition 29 (1976), pp. 1035, 1047.

Anderson, David. "An Inherited Form of Large Bowel Cancer Muir's Syndrome," Cancer 45 (1980), pp. 1103-1107.

Antonovsky, Aaron and Hartman, Harriet. "Delay in the Detection of Cancer: A Review of the Literature," Health Education Monographs 2 (Summer 1974), pp. 98-124.

Bond, John H. and Gilbertsen, Victor A. "Early Detection of Colonic Carcinoma by Mass Screening for Occult Stool Blood: Preliminary Report," Gastroenterology 72:5 (1977), p. A-8/1031.

Clayman, Charles. "Mass Screening: Is It Cost-Effective?" Journal of the American Medical Association 243 (1980), pp. 2067-2068.

Cromwell, Jerry and Gertman, Paula. "The Cost of Cancer," Laryngoscope 89 (1979), pp. 393-409.

Elwood, Thomas; Erickson, Allan; and Lieberman, Seymour. "Comparative Educational Approaches to Screening for Colorectal Cancer," American Journal of Public Health 68 (1978), pp. 135-138.

Emminzer-Benefield, Lazell. "Cues that Trigger Participation in Health Screening," American Journal of Nursing (September 1979), p. 1593.

Farrands, P. A.; Griffiths, R. L.; and Britton, D. C. "The Frome Experiment: Value of Screening for Colorectal Cancer," Lancet (June 6, 1981), pp. 1231-1232.

Gilbertsen, Victor, and Nelms, Janet. "The Prevention of Invasive Cancer of the Rectum," Cancer 41 (1978), pp. 1137-1139.

Glober, Gary and Peskoe, Stephen. "Outpatient Screening for Gastrointestinal Leisions Using Guaiac-Impregnated Slides," Digestive Diseases 19:5 (May 1974), pp. 399-403.

Greegor, David. "Occult Blood Testing for Detection of Asymptomatic Colon Cancer," Cancer 28:1 (July 1971), pp. 131-134.

Green, Lawrence. "Education Costs and Medical or Administrative Benefits," Health Education Monographs 2 (1974), pp. 41-59.

Green, Lawrence. "The Potential of Health Education Includes Cost Effectiveness," Hospitals 50 (1976), pp. 57-61.

Hardcastle, J. D. ; Balfour, T. W. ; Amar, S. S. "Screening for Symptomless Colorectal Cancer by Testing for Occult Blood in General Practice," The Lancet (April 12, 1980), pp. 791-793.

Hastings, Janis. "Mass Screening for Colorectal Cancer," The American Journal of Surgery, 127 (1974), pp. 228-233.

Kizilgash, Mehdi; Mattlin, C; Scisandra, H; and Murphy, G. "Community Cancer Screening Clinic: Evaluation of Experience," New York State Journal of Medicine (October 1979). pp. 1703-1707.

Kohler, John; Simonowith, D.; and Palogen, D. "Pre-op CEA Level: A Prognostic Test on Patients with Colorectal Carcinoma," American Surgeon 46 (1980), pp. 449-452.

Kirnick, John: Walley, L.; and Nakayamn, L. "Colorectal Cancer Detection in the Community Hospital Screening Program," Journal of American Medical Association 243 (1980). pp. 2056-2057.

Miller, Sidney and Knight, Ruth. "The Early Detection of Colorectal Cancer," Cancer 40 (1977). pp. 945-949.

Morris, David; Hansell, John; Ostrow, Donald; and Lee, Chuan-Shue. "Reliability of Chemical Tests for Fecal Occult Blood in Hospitalized Patients," Digestive Diseases 21:10 (October 1976), pp. 845-852.

Morgan, R. "Analysis of Health Advertising," Health Education 6 (1975), pp. 22-25.

Rocella, Edward. "Potential for Reducing Health Care Costs by Public and Patient Education." Public Health Reports 91 (1976). pp. 223-225.

Roddy, Bandaru; Hedges, A.; Laakso, K.; Wynder, E. "Metabolic Epidemiology of Large Bowel Cancer; Fecal Bulk and Constituents of the High Risk North American and Low Risk Finnish Population," Cancer 42 (1978), pp. 2832-2838.

Schweitzer, Stuart. "Cost Effectiveness of Early Detection of Diseases," Health Services Research (Spring 1974), pp. 22-32.

Sherlock, Paul and Winawer, Sidney. "The Role of Early Diagnosis in Controlling Large Bowel Cancer: An Overview, Cancer 40 (1977), pp. 2609-2615.

Skipper, James; Guenther, Antony; and Nass, Gilbert. "The Sacredness of .05: A Note Concerning the Uses of Statistical Levels of Significance in Social Science," The American Sociologist (February 1967). pp. 16-18.

Songster, Curtis; Barrows, George and Jarrett, Diane. "Immunochemical Detection of Fecal Occult Blood, The Fecal Smear Punch Disc Test: A New Non-Invasive Screening Test for Colorectal Cancer," Cancer 45 (1980), pp. 1099-1102.

Stearns, Maus W. "Progress: Fads, Fancies and Facts," Diseases of the Colon and Rectum 23:5 (July-August 1980), pp. 289-292.

Vobecky, Josef; Devroede, G.; Lacaille, J.; and Watier, A. "An Occupational Group With a High Risk of Large Bowel Cancer," Gastroenterology 75 (1978), pp. 221-223.

Weisburger, J. H. ;Reddy, B. S.; and Wynder, E. L. "Colon Cancer: Its Epidemiology and Experimental Production," Cancer 40 (1977), pp. 2141-2420.

Weisburger, John. "Mechanisms of Action of Diet as a Carcinogen," Cancer 43 (1979), pp. 1987-1995.

Wen, Chi-Pang and Tsai, Shan-Pur. "Doubts About Carpet Factor, Induced Colonic Cancer," Gastroenterology 76 (1978). pp. 656-657.

Winawer, Sidney. "Fecal Occult Blood Testing," Digestive Diseases 21 (1976), pp. 885-888.

Winawer, Sidney, "Screening for Colorectal Cancer: An Overview, "Cancer 45 (1980), pp. 1093-1098.

Winawer, Sidney; Andrews, Margo; Flehinger, Betty; Sherlock, Paul; Schottenfeld, David; and Miller, David. "Progress Report on Controlled Trial of Fecal Occult Blood Testing for the Detection of Colorectal Neoplasia," Cancer 45 (1980), pp. 2050-2064.

Winawer, Sidney; Leidner, Sheldon; Boyle, Camille, and Kurtz, Robert. "Comparison of Flexible Sigmoidoscopy with Other Diagnostic Techniques in the Diagnosis of Rectocolon Neoplasia," Digestive Diseases and Sciences 24:4 (April 1979), pp. 277-281.

Winawer, Sidney; Miller, Daniel; Schottenfeld, David; Leidner, Sheldon; Sherlock, Paul; Befler, Barbara; and Sterns, Maus. "Feasibility of Fecal Occult-Blood Testing for Detection of Colorectal Neoplasia: Debits and Credits; Cancer 40 (1977), pp. 2616-2619.

Winawer, Sidney; Sherlock, Paul; Schottenfeld, David; and Miller, Daniel. "Screening for Colorectal Cancer," Gastroenterology 70 (1976), pp. 783-789.

Winchester, David; Shull, James; Scanlon, Edward; Murell, Joanne; Smeltzer, Carolyn; Verba, Paula; Iden, Mary; Streelman, Dennis; Magpayo, Rosita; Dow, James; and Sylvester, Joanne. "A Mass Screening Program for Colorectal Cancer Using Chemical Testing for Occult Blood in the Stool," Cancer 45 (1980), pp. 2955-2958.

4. Proceedings

Breslow, Lester. "Review and Future Perspectives of Cancer Screening Programs," Presentation: Prevention and Detection of Cancer, Part II Detection Volume I High Risk Markers Detection Methods and Management, Proceedings of the Third International Symposium on Detection and Prevention of Cancer. (New York, April 26 - May 7, 1976), pp. 1177-1204.

Copeland, Murray. "New Approaches and Objectives in Controlling Cancer of the Colon and Rectum," Presentation: Prevention and Detection of Cancer Part II Detection Volume II Cancer Detection in Specific Sites, Proceedings of the Third International Symposium on Detection and Prevention of Cancer. (New York, April 26 - May 7, 1976), pp. 2093-2099.

Eddy, David. "The Economic Impact of Cancer and Cancer Control on Private Industry," Presentation: American Cancer Society National Public Education Committee. (Seattle, June 17, 1981), pp. 1-32.

Fletcher, S. Canadian Task Force on the Periodic Health Examination Condition: Carcinoma of the Colon and Rectum. (March 1978), pp. 1-15.

Gnauck, R. "Screening for Colorectal Cancer with Hemoccult," Presentation: Prevention and Detection of Cancer Part II Detection Volume I High Risk Markers Detection Methods and Management, Proceedings of the Third International Symposium on Detection and Prevention of Cancer. (New York, April 26 - May 7, 1976), pp. 397-401.

Greegor, David. "Detection of Colon Cancer in the Asymptomatic Patient," Presentation: Prevention and Detection of Cancer Part II Detection Volume II Cancer Detection in Specific Sites, Proceedings of the Third International Symposium on Detection and Prevention of Cancer. (New York, April 26 - May 7, 1976), pp. 2111-2113.

Halper, M. Synder; Winawer, Sidney; Brody, R.S.; Andrews, M.; Roth, D.; and Burton, G.. "Issues of Patient Compliance," Presentation: International Symposium on Colorectal Cancer: Epidemiology and Screening. (New York 1979), pp. 299-310.

Miller, A.B. "Economic Aspects of Screening for Cancer," Presentation: Prevention and Detection of Cancer Part II Detection Volume I High Risk Markers Detection Methods and Management, Proceedings of the Third International Symposium on Detection and Prevention of Cancer. (New York, April 26 - May 7, 1976), pp. 1225-1233.

Miller, Daniel; Grover, P.; Sutnick, A.; Samson, B.; and Bahn, A. "Selective Screening of High Risk Population Groups." Presentation: Prevention and Detection of Cancer Part II Detection Volume I High Risk Markers Detection Methods and Management, Proceedings of the Third International Symposium on Detection and Prevention of Cancer. (New York, April 27 - May 7, 1976), pp. 1219-1222.

Winawer, S.J.; Schottenfeld, D.; Miller, D.; Sherlock, P.; Deschner, E.; Stearns, M.; Watson, R.; Edelman, M.; Fleishner, M.; Schwartz, M.; Hajdu, S.; and Melamed, M. "Detection of Early Colon Cancer and Colonic Polyps." Presentation: Prevention and Detection of Cancer Part II Detection Volume II Cancer Detection and Specific Sites. Proceedings of the Third International Symposium on Detection and Prevention of Cancer. (New York, April 26-May 7, 1976), pp. 2103-2210.

Wynder, Ernst and Reddy, Bandaru. "Colon Cancer and the Prudent Diet," Presentation: Prevention and Detection of Cancer Part II Detection Volume II Cancer Detection in Specific Sites, Proceedings of the Third International Symposium on Detection and Prevention of Cancer. (New York, April 26 - May 7, 1976), pp. 2081-2088.

Appendix A

Cost

Table I

Direct Cost of Cancer 1969

Site	All Costs Average	Hospital	Non-Hospital	Incidence/100,000	Cost/100,000
Colon	$4,011	$2,875	$1,136	30.8	$123,539
Rectum	3,989	2,935	1,054	13.7	54,649

Average Cost per Patient Hospitalization Only

Site	Localized	Regional	Distant	Total
Colon	$2,526	$2,884	$3,441	$2,911
Rectum	2,935	3,560	3,691	3,360

Jerry Cromwell, "Cost of Cancer", Laryngoscope 89, (1979), p.404.

TABLE II

CANCER AND PRIVATE INDUSTRY

ANNUAL INCIDENCE AND MORTALITY OF FOUR CANCERS AND POTENTIAL IMPACT OF A CANCER CONTROL PROGRAM

Cancer	# People Exposed (Millions)	Incidence[2]	Mortality[3]	Potential Impact of Control Program Incidence	Mortality
Breast	26.0	17,141	6,838	0	-1,504
Cervix	26.0	5,354	2,206	0	-2,107
Colon					
Males	36.2	8,529	4,121	- 963	-1,430
Females	26.0	4,795	2,363	- 486	- 762
Total	62.2	13,324	6,484	-1,449	-2,192
Lung					
Males	36.2	16,471	13,759	-12,600	-10,500
Females	26.0	2,904	2,504	- 764	- 659
Total	62.2	19,375	16,263	-13,364	-11,159
TOTAL	62.2	55,194	31,791	-14,813	-16,962

David Eddy "The Economic Impact of Cancer and Cancer Control on Private Industry," Presentation: American Cancer Society Public Education Committee, (Seattle June 17,1981) p.7.

TABLE III

ESTIMATED ANNUAL COST TO INDUSTRY OF FOUR MAJOR CANCERS

Costs (Millions of $)

Cancer	Substitute Pay[4]	Disruption	Initial Care[6]	Terminal Care	Replacement	Life Insurance Benefits	Total	Lost Time (Yrs.)[10]	Lost Earnings ($)[11]
Breast	15.9	6.6	92.0	91.3	23.9	77.3	307.0	1690	999.5
Cervix	6.4	2.7	48.8	26.8	7.7	23.9	116.3	709	424.5
Colon									
Males	19.6	8.2	91.3	50.2	14.4	80.0	263.7	1201	748.3
Females	6.5	2.7	51.3	28.8	8.3	26.9	124.5	675	308.1
Total	26.1	10.9	142.6	79.0	22.7	106.9	388.2	1876	1056.4
Lung									
Males	39.6	16.5	171.2	141.9	28.2	269.0	686.4	2410	2389.2
Females	4.1	1.7	30.2	25.8	8.8	28.5	99.1	425	341.1
Total	43.7	18.2	201.4	167.7	57.0	297.5	785.5	2835	2730.3
TOTAL	92.1	38.4	484.8	364.8	111.3	505.6	1597.0	7110	5210.7

David Eddy, "The Economic Impact of Cancer and Cancer Control on Private Industry," Presentation: American Cancer Society Public Education Committee, (Seattle June 17,1981) p.8.

TABLE IV

POTENTIAL IMPACT OF A CANCER CONTROL PROGRAM:
DECREASE IN ANNUAL COST TO INDUSTRY OF FOUR MAJOR CANCERS

	Costs (Millions of $)								
Cancer	Substitute Pay[4]	Disruption[5]	Initial Care[6]	Terminal Care[7]	Replacement[8]	Life Insurance Benefits[9]	Total	Lost Time (Yrs)[10]	Lost Earnings ($)[11]
Breast	- 1.6	- 0.7	- 8.0	- 20.1	- 5.3	- 17.1	- 52.8	- 172	- 206.3
Cervix	- 3.6	- 1.5	-31.2	- 25.6	- 7.4	- 22.9	- 92.2	- 399	- 405.5
Colon									
Males	- 3.8	- 1.6	-17.4	- 17.4	- 5.0	- 28.2	- 73.4	- 230	- 180.9
Females	- 1.1	- 0.5	- 9.0	- 9.3	- 2.7	- 8.8	- 31.4	- 118	- 71.2
Total	- 4.9	- 2.1	-26.4	-26.7	- 7.7	- 37.0	-104.8	- 348	- 252.1
Lung									
Males	-30.3	-12.6	-131.0	-109.0	-36.8	-206.0	-525.7	-1840	-1820.0
Females	- 1.1	- 0.4	- 7.9	- 6.8	- 2.3	- 7.5	- 26.0	- 112	- 89.1
Total	-31.4	-13.0	-138.9	-115.8	-39.1	-213.5	-551.7	-1952	-1909.1
TOTAL	-41.5	-17.3	-204.5	-188.2	-59.5	-290.5	-801.5	-2871	-2773.1

David Eddy, "The Economic Impact of Cancer and Cancer Control on Private Industry," Presentation: American Cancer Society Public Education Committee, (Seattle June 17,1981) p.9.

TABLE V

COST OF A CASE OF
ADVANCED COLON CANCER

Sick leave pay	$ 1,800[4]
Disruption	800[5]
Initial care	18.400[5]
Terminal care	12,200[7]
Replacement	3,500[8]
Life Insurance Benefits	17.400[9]
Total cost to company	$54.100
Lost earnings	$150,000[11]

David Eddy, "The Economic Impact of Cancer and Cancer Contro
on Private Industry," Presentation: American Cancer
Society Public Education Committee, (Seattle June 17, 1981),
p. 10.

TABLE VI

PRESENT VALUE OF LIFETIME EARNINGS
Discounted at 6%, 1980*

Age	Male	Female
15-19	364,390	271.500
20-24	413,740	299,210
25-29	430,490	295,230
30-34	415,870	272,590
35-39	379,680	242,120
40-44	331,290	209,060
45-49	268,330	171,970
50-54	199,930	93,820
55-59	131,270	93,820
60-64	63,290	54,060

*Adapted from Hodgson and Rice, "Costs of Cancer in the United States, 1977," National Center for Health Statistics, June 1979. A 10% annual inflation rate, was applied to the 1977 data to estimate lost earnings in 1980 dollars.

David Eddy, "The Economic Impact of Cancer and Cancer Control on Private Industry," Presentation: American Cancer Society Public Education Committee, (Seattle June 17, 1981), p. 18.

TABLE VII

CHANGES IN THE ECONOMIC IMPACT ON PRIVATE INDUSTRY
OF THREE CANCERS
USING PESSIMISTIC ASSUMPTIONS FOR PROPORTIONS DETECTED
IN EACH STAGE OF DISEASE

			Annual Benefits (millions of $)			
Cancer	Incidence	Mortality	Cost of Care	Other Company Costs	Total Company Costs	Present Value Lost Earnings
Breast	0	-1090	-20.9	- 18.0	- 38.9	- 150.4
Cervix	0	-1780	-48.0	- 29.8	- 77.8	- 341.9
Colon						
Males	0	-1020	-18.8	- 25.7	- 44.5	- 135.0
Females	0	- 549	-10.0	- 8.9	- 18.9	- 50.3
Total	0	-1569	-28.8	- 34.6	- 63.4	- 185.3
TOTAL	0	-4439	-97.7	- 82.4	-180.1	- 677.6

David Eddy, "The Economic Impact of Cancer and Cancer Control on Private Industry," Presentation: American Cancer Society Public Education Committee, (Seattle, June 17, 1981), p. 26.

TABLE VIII

CHANGES IN THE ECONOMIC IMPACT ON PRIVATE INDUSTRY
OF THREE CANCERS
DUE TO CANCER CONTROL
USING OPTIMISTIC ASSUMPTIONS FOR PROPORTIONS DETECTED
IN EACH STAGE OF DISEASE

			Annual Benefits (millions of $)			
Cancer	Incidence	Mortality	Cost of Care	Other Company Costs	Total Company Costs	Present Value Lost Earnings
Breast	0	- 1920	- 35.3	- 31.4	- 66.7	- 262.3
Cervix	0	- 2160	- 58.4	- 36.2	- 94.6	- 416.1
Colon						
Males	- 2410	- 1910	- 55.8	- 54.2	-110.0	- 234.4
Females	- 1210	- 1010	- 29.0	- 18.4	- 47.4	- 92.4
	- 3620	- 2920	- 84.8	- 72.6	-157.4	- 326.8
TOTAL	- 3620	- 7000	-178.5	-140.2	-318.7	-1005.2

David Eddy, "The Economic Impact of Cancer and Cancer Control on Private Industry," Presentation: American Cancer Society Public Education Committee, (Seattle, June 17, 1981), p. 27.

Appendix B

Risk Factors in Colorectal Cancer

Risk Factors in Colorectal Cancer

Age:	Over Age 40 in Asymptomatic Men and Women
Associated Disease:	Ulcerative Colitis Granulomatous Colitis Peutz-Jeghers Syndrome Familial Polyposis Syndromes
Past History:	Colon Cancer or Polyps Female Genital or Breast Cancer
Family History:	Juvenile Polyps Colon Cancer or Polyps Familial Polyposis Syndromes

---

Winawer et al., "Screening for Colon Cancer," Gastroenterology 76, (1976), p. 784.

Appendix C

Compliance

Health Belief Model

Individual perceptions (level of readiness to take recommended action)	Modifying factors	Outcome
Motivation a. Belief in asymptomatology b. Perceived control over health matters c. Attitude and faith in medical care d. General health concern	General a. Demographic variables b. Psychosocial variables c. Personal and family history d. Experiences with disease in question (site)	
Value of threat reduction a. Perceived severity of disease b. Perceived susceptibility c. Belief in interference of disease with aspects of daily life	Readiness to take recommended health action	Likelihood of compliance with a. Learning and changing attitudes and beliefs b. Following medical advice c. Changing risk-reducing behaviors
Probability of action reducing the threat a. Belief in benefit of the action b. Perceived efficacy of test regimen c. Belief in modern medicine	Cues to action a. Mass media campaign b. Symptoms c. Peer group pressure d. Letters or phone calls from medical facility e. Illness or death of family member or friend f. Newspaper or magazine article	

Source: M. Snyder Halper et. al., "Issues of Patient Compliance," International Symposium on Colorectal Cancer; Epidemiology and Screening. (New York 1979), p.302.

Appendix D

Methodology - Questionnaires

SURVEY A

Select the most appropriate answer

1. Sex
   1. Male _____
   2. Female _____

2. Age
   1. Less than 20 years _____
   2. 20-29 years _____
   3. 30-39 years _____
   4. 40-49 years _____
   5. 50-59 years _____
   6. 60 Over _____

3. Ethnic Origin
   1. White _____
   2. Black _____
   3. Other _____

4. Highest level of Education Completed
   1. Grade School (K-8) _____
   2. High School (9-12) _____
   3. College (2 yrs) _____
   4. College (4 yrs) _____
   5. Post graduate _____

5. Occupation
   1. Supervisory _____
   2. Clerical _____
   3. Craft _____

6. Your last visit to your doctor
   1. Within 1 year _____
   2. Within 1-2 years _____
   3. Within 2-3 years _____
   4. More than 3 years _____

7. Have you heard the term Colorectal Cancer before?
   1. Yes _____
   2. No _____
   3. Don't Know _____

   If yes, your information source (fill in)

   _____

8. Have you participated in a Colorectal Screening Program?
   1. Yes _____
   2. No _____
   3. Don't Know _____

9. Have you been tested or examined for Colorectal Cancer in the last year?
   1. Yes _____
   2. No _____
   3. Don't Know _____

10. Have you ever had a Hemoccult (Guaiac) Test?
    1. Yes _____
    2. No _____
    3. Don't Know _____

The presence of which of the following signs may indicate the need for further evaluation by your doctor and follow-up testing for Colorectal Cancer?

11. Persistant Lower Abdominal pain
    Yes _____ No _____ Don't Know _____

12. Change in bowel habits
    Yes _____ No _____ Don't Know _____

13. Blood in the stool
    Yes _____ No _____ Don't Know _____

14. Persistant diarrhea
    Yes _____ No _____ Don't Know _____

15. Persistant constipation
    Yes _____ No _____ Don't Know _____

16. "Ribbon" like bowel movements
    Yes _____ No _____ Don't Know _____

17. Rectal Pain or Pressure
    Yes _____ No _____ Don't Know _____

The following questions involve high risk indicators:

18. Individuals become high risk for Colorectal Cancer beginning
    1. 20-29 years _____
    2. 30-39 years _____
    3. 40-49 years _____
    4. 50-59 years _____
    5. 60 Over _____

19. By sex this cancer affects
    1. More males _____
    2. More females _____
    3. Both sexes equally _____
    4. Don't Know _____

20. By race this cancer affects
    1. Whites _____
    2. Blacks _____
    3. Hispanics _____
    4. All races equally _____
    5. Don't Know _____

21. Persons with a personal history of cancer
    Yes _____ No _____ Don't Know _____

22. Persons with a history of cancer in the immediate* family
    Yes _____ No _____ Don't Know _____

23. Persons with a history of Colorectal Cancer in the immediate family
    Yes _____ No _____ Don't Know _____

24. Persons previously diagnosed with Ulcerative Colitis
    Yes _____ No _____ Don't Know _____

25. Persons previously diagnosed with Colorectal Polyps
    Yes _____ No _____ Don't Know _____

26. Do you perceive Colorectal Cancer to be a major health problem?
    Yes _____ No _____ Don't Know _____

27. Do you perceive yourself to be at risk
    Yes _____ No _____ Don't Know _____

28. Are you willing to participate in a "Do-it-Yourself" test to detect cancer?
    Yes _____ No _____ Don't Know _____

*Immediate family consists of mother, father, sister and brother.

SURVEY B

Post Test - Immediately after the program

1. Sex
   1. Male _____
   2. Female _____

2. Age
   1. Less than 20 years _____
   2. 20-29 years _____
   3. 30-39 years _____
   4. 40-49 years _____
   5. 50-59 years _____
   6. 60 over _____

3. Ethnic Origin
   1. White _____
   2. Black _____
   3. Other _____

4. Highest level of education completed
   1. Grade School (K-8) _____
   2. High School (9-12) _____
   3. College (2 years) _____
   4. College (4 years) _____
   5. Post graduate _____

5. Occupation
   1. Supervisory _____
   2. Clerical _____
   3. Craft _____

6. Your last visit to your doctor
   1. Within 1 year _____
   2. Within 1-2 years _____
   3. Within 2-3 years _____
   4. More than 3 years _____

7. Have you heard the term Colorectal Cancer before?
   1. Yes _____
   2. No _____
   3. Don't Know _____

   If yes, your information source (fill in)

   _____

8. Have you participated in a Colorectal Screening Program?
   1. Yes _____
   2. No _____
   3. Don't Know _____

9. Have you been tested or examined for Colorectal Cancer in the last year?
   1. Yes _____
   2. No _____
   3. Don't Know _____

10. Have you ever had a Hemoccult (Guaiac) Test?
    1. Yes _____
    2. No _____
    3. Don't Know _____

11. Colorectal Cancer can be detected by
    1. Proctoscope Examination
    2. Digital (finger) Examination
    3. Hemoccult Test
    4. All of the above
    5. Don't Know

12. High risk for Colorectal Cancer includes
    1. Sex
    2. Occupation
    3. Age
    4. Education

13. Risk is increased by
    1. History of Colorectal Cancer in the family
    2. A personal history of cancer
    3. History of cancer in the family
    4. 1 and 2
    5. 1, 2 and 3
    6. 2 and 3

14. Certain diseases are known to increase the risk of Colorectal Cancer
    1. Ulcerative Colitis
    2. Benign Colorectal Polyps
    3. Hemorrhoids
    4. Constipation
    5. 1 and 2
    6. All of the above

15. Colorectal Cancer may be indicated by certain signs. Indicate which of the following is NOT a sign.
    1. Change in bowel habits
    2. Blood in the stool
    3. Persistant lower abdominal pain
    4. Persistant diarrhea
    5. Rectal pain or pressure

16. The Hemoccult Test is one which detects the presence of
    1. Cancer cells
    2. Hidden blood
    3. Sugar
    4. Chemical reagent
    5. Don't Know

17. Early Detection and treatment can
    1. Be costly
    2. Be of minimal value
    3. Avoid major surgery
    4. Avoid death
    5. 3 and 4

18. Colorectal Cancer may be linked to
    1. Lifestyle
    2. Diet high in red meat and refined carbohydrates
    3. Diet low in fiber content
    4. Chronica Ulcerative Colitis
    5. All of the above

19. Control of Colorectal Cancer includes
    1. Early detection and treatment
    2. Regular health check-ups
    3. Participation in Colorectal Cancer screening programs
    4. Eating foods high in fiber and low in carbohydrates with a limited amount of red meat
    5. All of the above

20. The diet instructions included for the hemoccult test are
    1. Avoid vitamin C or ascorbic acid preparations
    2. Avoid red meat, fish, chicken, turnips and horseradish
    3. Avoid aspirin
    4. Include fresh fruit and vegetables, as well as, peanuts, popcorn, and bran
    5. All of the above

21. The program was
    1. Limited in value to me
    2. Interesting but unimportant to me
    3. Important but not pertinent to me
    4. Important, pertinent and informative to encourage participation in the screening program

22. Do you perceive yourself to be at high risk
    1. Yes _____
    2. No

SURVEY C Select the most appropriate answer

1. Sex
   1. Male ___
   2. Female ___

2. Age
   1. Less than 20 years ___
   2. 20-29 years ___
   3. 30-39 years ___
   4. 40-49 years ___
   5. 50-59 years ___
   6. 60 over ___

3. Ethnic Origin
   1. White ___
   2. Black ___
   3. Other ___

4. Highest level of Education completed
   1. Grade School (K-8) ___
   2. High School (9-12) ___
   3. College (2 years) ___
   4. College (4 years) ___
   5. Post graduate ___

5. Occupation
   1. Supervisory ___
   2. Clerical ___
   3. Craft ___

6. Your last visit to your doctor
   1. Within 1 year ___
   2. Within 1-2 years ___
   3. Within 2-3 years ___
   4. More than 3 years ___

7. Have you been tested or examined for Colorectal Cancer in the last year?
   1. Yes ___
   2. No ___
   3. Don't know ___

8. Have you ever had a Hemoccult (Guaiac) Test?
   1. Yes ___
   2. No ___
   3. Don't know ___

The presence of which of the following signs may indicate the need for further evaluation by your doctor and follow-up testing for Colorectal Cancer?

9. Persistant Lower Abdominal pain
   Yes ___ No ___ Don't know ___

10. Change in bowel habits
    Yes ___ No ___ Don't know ___

11. Blood in the stool
    Yes ___ No ___ Don't know ___

12. Persistant diarrhea
    Yes ___ No ___ Don't know ___

13. Persistant constipation
    Yes ___ No ___ Don't know ___

14. "Ribbon" like bowel movements
    Yes ___ No ___ Don't know ___

15. Rectal pain or pressure
    Yes ___ No ___ Don't know ___

The following questions involve high risk indicators:

16. Individuals become high risk for Colorectal Cancer beginning
    1. 20-29 years ___
    2. 30-39 years ___
    3. 40-49 years ___
    4. 50-59 years ___
    5. 60 over ___

17. By sex this cancer affects
    1. More males ___
    2. More females ___
    3. Both sexes equally ___
    4. Don't know ___

18. By race this cancer affects
    1. Whites ___
    2. Blacks ___
    3. Hispanics ___
    4. All races equally ___
    5. Don't know ___

19. Persons with a personal history of cancer
    Yes ___ No ___ Don't know ___

20. Persons with a history of cancer in the immediate* family
    Yes ___ No ___ Don't know ___

21. Persons with a history of Colorectal Cancer in the immediate family
    Yes ___ No ___ Don't know ___

22. Persons previously diagnosed with Ulcerative Colitis
    Yes ___ No ___ Don't know ___

*Immediate family consists of mother, father, brother, and sister

23. Persons previously diagnosed with Colorectal Polyps
    Yes ___ No ___ Don't know ___

24. Do you perceive Colorectal Cancer to be a major health problem?
    Yes ___ No ___ Don't know ___

25. Do you perceive yourself to be at risk?
    Yes ___ No ___ Don't know ___

26. Describe your <u>most significant reason</u> for participating in the program
    1. I am high risk for Colorectal Cancer
    2. The test is an important part of a health check-up
    3. The test is easily self-administered
    4. The test can be performed in the privacy of one's home
    5. Other _____

27. Describe your most significant reason for <u>NOT</u> participating in the program
    1. I am <u>NOT</u> high risk
    2. I had a recent examination with a Hemoccult test
    3. The diet instruction are too difficult to follow
    4. The test is unpleasant to perform
    5. The test is not important or of interest to me

28. Did you participate in <u>the</u> recent Colorectal Screening Program?
    Yes ___ No ___

29. Have you ever participated in a Colorectal Screening Program?
    Yes ___ No ___

30. If available would you participate in a Screening program next year?
    Yes ___ No ___ Maybe ___

31. Your suggestions and comments regarding the program are welcomed.

Appendix E
Program Preparation

CORPORATE HEMOCULT SCREENING SCHEDULE

Dates	Time	Department	Location
April 7, 1981	7:30 a.m.	Construction	W. Henrietta Rd.
	8:00 a.m.	I/R	Conference Room
	9:00 a.m.	All others	2nd Floor
	10:00 a.m.	"	
	11:00 a.m.	"	
	1:30 p.m.	All 8th floor	Sibley Tower Bldg.
	2:30 p.m.	employees	Conference Room A
	3:30 p.m.		
April 8, 1981	7:30 a.m.	Construction	78 Bennington Rd.
	8:00 a.m.	I/R	Garage
	1:30 p.m.	All 7th floor	Sibley Tower Bldg.
	2:30 p.m.	employees	Conference Room A
	3:30 p.m.		
April 9, 1981	7:30 a.m.	Construction	1847 Empire Blvd.
	8:00 a.m.	I/R	
	1:30 p.m.	All 9th floor	Sibley Tower Bldg.
	2:30 p.m.	employees	9th floor Confer-
	3:30 p.m.		ence Room
April 10, 1981	7:30 a.m.	Construction	Whitney Rd.
	8:00 a.m.	I/R	Garage
	7:30 a.m.	Construction	Union Street
		I/R	Garage
	1:30 p.m.	Network Svcs.	120 Plymouth Ave.
	2:30 p.m.	"	95 N. Fitzhugh
	3:30 p.m.	"	Pinnacle Confer-
			ence Room
April 13, 1981	7:30 a.m.	Construction	Groveland Road
	8:00 a.m.	I/R	Mt. Morris
	1:30 p.m.	Network Svcs.	120 Plymouth Ave.
	2:30 p.m.		95 N. Fitzhugh
	3:30 p.m.		Pinnacle Confer-
			ence Room
April 14, 1981	8:00 a.m.	I/R	Howell Street
	10:00 a.m.	All employees	Stone Street
	11:00 a.m.	"	" "
	1:30 p.m.	All employees	Genesee Street
	2:30 p.m.	"	"

CORPORATE HEMOCCULT SCREENING SCHEDULE (Cont'd.)

Dates	Time	Department	Location
April 15, 1981	7:30 a.m. 8:00 a.m.	Construction I/R	7819 Rt. 5 and 20 Garage
	10:00 a.m. 11:00 a.m.	All employees "	Canandaigua Cl. 17 Chapin Street
April 16, 1981	9:00 a.m. 10:00 a.m.	All employees "	Perington Co.
	1:30 p.m. 2:30 p.m.	All employees "	111 Field Street
April 17, 1981	8:00 a.m. 9:00 a.m. 10:00 a.m.	All employees	9 Highland Geneseo 2nd Floor
	1:30 p.m. 2:30 p.m.	All employees	Norton Street
April 20, 1981	8:30 a.m. 10:00 a.m.	Com'l/Acctg. Personnel/ Executive	Midtown Lounge Midtown 4th Floor
April 21, 1981	8:30 a.m. 10:00 a.m.	Com'l/Acctg. Personnel/ Executive	Midtown Lounge Midtown 4th Floor
April 22, 1981	8:30 a.m.	Com'l/Acctg.	Midtown Lounge
April 23, 1981	8:30 a.m.	Com'l/Acctg.	Midtown Lounge
April 24, 1981	1:30 p.m. 2:30 p.m. 3:30 p.m.	Network Svcs.	120 Plymouth Ave. 95 N. Fitzhugh St. Pinnacle Conference Room
	6:30 p.m. 7:30 p.m. 8:30 p.m.	Network Svcs.	120 Plymouth Ave. 95 N. Fitzhugh St. Pinnacle Conference Room
April 28, 1981	7:30 a.m. 8:00 a.m. 8:30 a.m.	All employees	Dansville Office

ROCHESTER TELEPHONE CORPORATION
Personnel Department

March, 13, 1981

TO: All Committee Members of the Interdepartmental Health and Safety Committee

As a continuing effort to bring health awareness to our employees, we are again fortunate to make available to all our employees the Colorectal Cancer Screening Program.

You may recall that this program was last offered to our employees in 1979. The program consisted of a film "The Cancer No One Talks About", employee surveys, and the hemoccult test kit for those employees who chose to participate in the entire program.

The 1981 program is very similar and again will be presented through the cooperation of the American Cancer Society and the State University of Brockport.

As in the past, I need your assistance in putting on the program. Attached is a letter and survey Sheet A which requires immediate distribution to all employees within your area of responsibility as Safety Coordinator.

Also attached is a copy of the schedule, and it would be of great help if you could make arrangements for a 16 MM movie projector and screening to be available and set up for the program.

I have also taken the liberty to reserve all conference rooms as indicated on the schedule.

Thank you for your anticipated participation in the program; and if you have any questions, please call me at 921-2620.

G. E. Allen
Personnel Manager-
Benefit Administration

GEA/kaf
Attachment

ROCHESTER TELEPHONE CORPORATION

Personnel Department

March 13, 1981

Mr. D. W. Ackerman - Director of Corporate Planning
Mr. G. W. Bott - Director of Customer Services
Mr. R. M. Curran - Director of Accounting
Mr. A. Margeson - Director of Marketing & Revenue Requirements
Mr. A. W. Maurer - Director of Engineering
Mr. J. T. Tuohey - Controller
Mr. M. A. Weins - Director of Network/Construction & Maintenance
Mr. J. P. VanCleave - Director of International Market Assessment

The Interdepartmental Health and Safety Committee has again been successful in making available to all employees the Hemoccult Screening Program which was offered in 1979.

The purpose of this screening program is to educate the employees on colorectal cancer and provide a method of early detection.

The American Cancer Society has estimated there will be 120,000 new cases of colorectal cancer this year. Knowledge of this disease and early detection will save many of these lives - lack of this knowledge will cost an estimated 55,000 lives.

The presentation of the program requires a time commitment of about 30 minutes. After the presentation, the employees who wish to participate can do so in the privacy of their home.

As in the past, this program has been scheduled to accommodate the employees' work tour with an all out effort to minimize the disruption of the workforce. This year's program will commence on April 7, 1981 and run through April 24, 1981. A copy of the schedule has been attached.

We are looking forward to your continued support in our effort to bring good health to our employees.

L. J. Hartrick
Personnel Director -
Employee Relations

cc: Officers
Attachment

State University of New York
COLLEGE AT BROCKPORT
Brockport, New York 14420

Division of Public Service
and Continuing Education 716-395-2755

March 18, 1981

To: Peter Smits

From: A. D. Virgilio

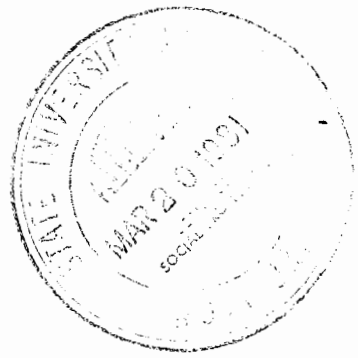
Re: Public Service Request

I have received a request from Dean Phillips concerning an invitation from Rochester Telephone Company to co-sponsor a Public Service Message dealing with "Cancer Screening". Since the nature of the request relates to Public Relations as well as Public Service I'm seeking your opinion.

Attached is a copy of an announcement which Rochester Telephone is willing to distribute to its employees. It's the result of a project initiated by Dean Phillips and carried further by a Graduate Assistant in Health Science - Mary Chizuk. Our own Educational Communication Center developed the material seen on the attached.

Please let me know your thinking.

ADV:gw
cc: Dean John Phillips
Mr. Robert Loeb
enc.



AMERICAN
CANCER
SOCIETY

MONROE COUNTY UNIT
1400 Winton Road N.
Box 4006
Rochester, New York 14609
(716) 288-1950

NEW YORK STATE DIVISION, INC.

March 18, 1981

COVER LETTER

Rochester Telephone Company
100 Midtown Plaza
Rochester, New York 14646

Dear Employee:

The Rochester Telephone Company has been requested to participate in a Health Education Research Program. Participation in the program includes completion of three questionnaires, attendance at an informational meeting, and a self-test relating to cancer of the colon and rectum. Although some questions may seem repetitious, the questionnaire design is in accordance with accepted research procedures. Please answer all questions to contribute to the information.

Questionnaire information will remain confidential. It is not necessary that your name be recorded on the questionnaire.

Results of the questionnaires and the Health Education Program will be made available on request to interested participants.

Enclosed is the first questionnaire. Please complete and return it to your supervisior or Health and Safety Committee representative by no later then Tuesday, March 24.

Our hope is that you will give us your time and your thoughts to assist in planning future Health Education Programs.

Thank you for your participation.

Sincerely,

George Allen
Personnel Manager
Rochester Telephone Company

Kelli McMahon
Director, Public Education
American Cancer Society

Mary Christine Chizuk
Researcher, Health Science Department
State University College at Brockport

Enc.

PAYROLL INSERT ADVERTISEMENT

Page 1

Cancer of the colon and rectum is the cancer "nobody talks about." Last year 55,000 people didn't talk about it. They died from it.

Will the 2,363 employees of the Rochester Telephone Company talk about it?

We hope so.

Page 2

Some Talk:

In 1950 there was no easy way to test for colorectal cancer. In 1981 there is:

"In 1950 many of us didn't need to worry about colorectal cancer; we were in grade school or high school. In 1981, as many of us approach (or have passed) age 40, we should. Why"

"According to the American Cancer Society, an estimated 120,000 new cases of colorectal cancer will be discovered this year, mostly in men and women over age 40. Many of those who discover it early will be successfully treated.... and will live. However, many will discover it when it's too late.

"Today, when we are at the age when we should be concerned, early detection of colorectal cancer is easier than ever. It can be done at home...painlessly...for free."

More Talk:

"In the next few days a film and a presentation about early detection of colorectal cancer will be announced, and

we are expecting many telephone company employees to attend. Please, be one of them. And please, take the test."

A public service of the American Cancer Society, the Rochester Telephone Company, and the State University of New York, College at Brockport.

Cancer of the colon and rectum is the cancer "nobody talks about." Last year 55,000 people didn't talk about it. They died from it.

Will the 2,363 employees of the Rochester Telephone Company talk about it?

We hope so.

Let's Talk.

Date:

Time:

Place:

POSTER

A public service of the American Cancer Society, the Rochester Telephone Company, and the State University of New York College at Brockport

iet Instructions: To assure accuracy of test results follow the diet nstructions for 48 hours before collecting the first speciman and continue ntil all three (3) specimens are collected.

1.) Avoid rare red meat as well as turnips and horseradish.

2.) Avoid aspirin preparations in excess of two (2) tablets per day and Vitamin C (ascorbic acid) in excess of 250 mg per day.

3.) Include fresh vegetables especially lettuce, spinach and corn.

4.) Include fruits especially prunes, grapes, plums and apples.

5.) Include moderate amounts of peanuts, popcorn and bran-containing cereals.

EMOCCULT SLIDE INSTRUCTIONS: To assist the laboratory in reporting accurate est results to the Medical Coordinator:

1.) Please complete the test as soon as possible.

2.) Return complete Hemoccult Test Slides to the Rochester Telephone Company, Benefit Office, 100 Midtown Plaza, Rochester, N.Y. 14646, via U.S. Mail or Interdepartmental Mail within seven days (7) days of the first test day.

3.) Menstrual bleeding and rectal bleeding due to hemorrhoids will affect test results.
*Do not collect specimens if these conditions are present.

4.) Thursday, May 14 is the deadline for returning complete Hemoccult Test Slides

5.) Please include the following information (for accurate employee identification) * Ignore Hemoccult Slide Information Card.

Employee's Full Name_____

Employee Identification Number_____

Age_____

Address_____

Doctor's Full Name_____

Address_____

_____, give permission for the Medical Coordinator of
ıe Colorectal Cancer Screening Program, Dr. Ben Sischy, to notify my doctor
: positive (+) Hemoccult Slide Test results. It has been communicated to me
ıat the Hemoccult Test is not a specific test for cancer of the colon and
ɔctum, but positive results indicate further medical investigation.

ɯployee's full name_____

ɯployee Identification Number_____

ıdress_____

_____

ɔctor's full name_____

ddress_____

_____

MASTER CONTROL FORM

ROCHESTER TELEPHONE COMPANY

Laboratory Reporting Hemoccult Screening Results

	Employee Number	Age	Physician Name	Address	Specimen 1	2	3	Re

Appendix F

Letters of Notification for Program Participants

AMERICAN
CANCER
SOCIETY

NEW YORK STATE DIVISION, INC.

MONROE COUNTY UNIT
1400 Winton Road N.
Box 4006
Rochester, New York 14609
(716) 288-1950

Negative Hemoccult Test Results to Program Participants

Dear

We are pleased to notify you that your Hemoccult Test results are negative. No hidden (occult) blood was detected in your stool specimens.

We wish to remind you again that even though your Hemoccult Test was negative it does not eliminate the need for regular health check-ups by your doctor.

Thank you for participating in the Hemoccult Screening Program.

Sincerely,

Kelli Mc Mahon

Kelli McMahon
Director, Public Education
American Cancer Society

Mary Christine Chizuk

Mary Christine Chizuk
Researcher
SUNY Brockport

HIGHLAND HOSPITAL OF ROCHESTER
A MAJOR AFFILIATE OF THE UNIVERSITY OF ROCHESTER SCHOOL OF MEDICINE AND DENTISTRY

DAISY MARQUIS JONES RADIATION ONCOLOGY CENTER

Sischy & Sobel, P.C.
Ben Sischy, M.D.
Sidney Sobel, M.D.

Physicist
Roland Bramlet, Ph.D.

Positive Hemoccult Test Results to Program Participants

Dear

We wish to notify you that your Hemoccult Test results are positive. Hidden (occult) blood was detected in your stool specimen.

This means you may have a significant source of bleeding in your gastrointestinal tract. Most causes of such bleeding are benign, meaning not malignant. A positive Hemoccult Test does warrant further investigation by your doctor to identify the bleeding source. The individual you have previously identified as your doctor is also being notified of your positive Hemoccult Test results. We urge you to visit your doctor without delay to determine the cause of bleeding.

We will be in further contact with you and your doctor to follow-up on your examination and test results.

Sincerely yours,

Ben Sischy, M.D., F.A.C.R.
Medical Coordinator

BS/ga

HIGHLAND HOSPITAL OF ROCHESTER
A MAJOR AFFILIATE OF THE UNIVERSITY OF ROCHESTER SCHOOL OF MEDICINE AND DENTISTRY

DAISY MARQUIS JONES RADIATION ONCOLOGY CENTER

Sischy & Sobel, P.C.
Ben Sischy, M.D.
Sidney Sobel, M.D.

Physicist
Roland Bramlet, Ph.D.

Positive Hemoccult Test Results to Program Participant's Doctor

RE:

Dear

_____ has named you as his/her physician when participating in a colo-rectal screening project by the American Cancer Society. Participants in this project were given three "Do-it-yourself" guaiac slides for completion at home after dieting preparations.

This letter is to inform you that the results of the test were positive for hidden blood in the stool. Your patient has been informed of the results and has been strongly urged to seek medical attention.

You will be receiving a follow-up letter and questionnaire within the next few weeks to determine what medical tests and treatment, if any, were needed. All test results are strictly confidential and will be used only for statistical purposes.

Sincerely yours,

Ben Sischy, M.D., F.A.C.R.
Medical Coordinator

BS/ga

SOUTH AVENUE AT BELLEVUE DRIVE / ROCHESTER, NEW YORK 14620 / TELEPHONE (716) 473-2200

Positive Hemoccult Test Results Follow-up
To Program Participants

Dear

Several weeks ago you were notified that your Hemoccult Test results were positive and were urged to visit your doctor for further testing. All individuals with positive test results are being contacted for follow-up information. Your assistance is most valuable in completing our follow-up. After you have seen your doctor complete the enclosed forms and mail it in the self-addressed stamped envelope provided.

Your name and medical information will remain confidential. No names or identification numbers will appear on any reports.

Thank you for your cooperation.

Sincerely,

_____

Medical Coordinator

e Hemoccult Test Results Follow-up to Participant's Physician

you notified of Hemoccult results? Date_____

you see your doctor? Date_____

ctoscopic (procto) examination performed? Yes_____ No_____

ium X-Ray (Barium Enema) of the colon performed? Yes_____ No_____

ment recommended? Yes_____ No_____

scribe _____

_____

_____

Appendix G

Post Program Publicity

Graduate Student 'Reaches Out and Touches' Phone Company Employees

Colo-rectal cancer is billed as the cancer nobody talks about, but a graduate student at the SUNY College at Brockport has changed that for employees of the Rochester Telephone Company.

Mary Chizuk, a graduate student in community health education in the health sciences department, joined forces with George "Bud" Allen director of benefits at Rochester Telephone, and Kellie McMahon public education director of the local American Cancer Society, to teach phone company employees about colo-rectal cancer.

The trio coordinated a presentation on the disease with a film, question and answer sheet, and a fact sheet on the "how-to's" of screening. They traveled to service garages and main offices trying to get employees to participate in the voluntary cancer screening.

Chizuk says that colo-rectal screening kits were passed out to more than 100 interested phone company employees. Partipants received a hemoccult kit containing slides and two "sticks" for the screening. The kits cost about 58 cents each, but were donated free of charge by the Cancer Society. The Highland Hospital lab processed the tests free of charge.

Three people were discovered to have positive readings, Chizuk said. The reading does not mean the individuals have colo-rectal cancer, but does mean that they should have

further tests.

Chizuk feels that this sort of educational program and health testing is important in an industrial setting. "Health education in the work place hasn't been done before," she says. "We need to make time for it for our health and safety, to improve our quality of life, and to better care for our employees."

Chizuk hypothesizes that "It is cost-effective to do colo-rectal cancer screening in an industrial setting." That means that the time and money spent on the testing will be more than made up if just one person tested has colo-rectal cancer. She says it's better to detect the disease early and save an employer from expending large disability payments.

"Graduate Student 'Reaches Out and Touches' Phone Company Employees." Brockport Post, 10 June 1981.

Reach Out and Teach Someone

Colo-rectal cancer is billed as the cancer nobody talks about, but a graduate student in the health sciences department started employees of the Rochester Telephone Company talking about it.

Mary Chizuk, a graduate student in community health education joined forces with Rochester Telephone and the American Cancer Society to teach phone company employees about colorectal cancer.

She traveled to service garages and main offices with a film, a question and answer sheet, and facts on the "how-to's" of screening.

Chizuk said that 750 employees attended the educational programs and more than 250 participated in the voluntary cancer screening. She said that three people were discovered to have positive readings. She explained that the positive readings did not mean the individuals had cancer, but did mean that they needed further testing.

Chizuk believes that this sort of educational program and health testing is important in an industrial setting. "Health education in the work place hasn't been done before," she says.

The project was carried out under the direction of John Sinacore, chairperson of health sciences and Ara Aulalian, professor of health science.

"Reach Out and Touch Someone," Brockport Statements, 13 July 1981.

Public Education And
Rochester Telephone

The American Cancer Society and Rochester Telephone are cooperating on a program of education and service to employees. Over 2300 Rochester Telephone employees have the opportunity to attend a program about Colorectal cancer during work hours in April. Outstanding work by volunteer George "Bud" Allen, Personnel Manager, has made the program possible. Each attendee is offered a free "do-it-yourself" Guaiac test which detects hidden blood in the stool. The slides will be read by Highland Hospital Laboratory personnel and publicity material was prepared by the State College at Brockport. Everyone involved deserves high marks for service.

"Public Education and Rochester Telephone." The Report, American Cancer Society Monroe County Unit, Volume 1 Number 1, Spring Edition, 1981.